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BUREAU OF MINES

SCOTT TURNER, DIRECTOR

ANALYSES OF VIRGINIA COALS

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PREFACE

One of the important functions of the Bureau of Mines has been the analyzing of samples of coal from every coal-mining State and from Alaska. The analyses are being published for the information of Government officials and the public.

These samples have been collected in mines by representatives of the Bureau of Mines and by geologists of the United States Geological Survey in investigations of mineral resources; they have been collected from coal delivered for the use of Government Departments—Treasury, Navy, and War—and for various Government institutions; they have also come from coal obtained for tests by the bureau in investigating the utilization of fuel and the explosibility of coal dust. Many samples have been collected and analyzed in connection with the work of various State geological surveys.

From time to time the bureau has published the analytical results in large bulletins. Although the analyses in any one bulletin are grouped by States, or by special uses, to look up the analyses of coals from any particular section of the country necessitates the perusal of a number of bulletins, some of which are no longer available for free distribution.

Moreover, when the bureau receives an inquiry for analyses of coal from any desired part of the country, it constitutes a large wastage of printed documents to send a number of bulletins in order to show the analyses for only one mining district in a State, or even for an individual mine. It therefore is deemed expedient to republish the analyses of coal in a series of inexpensive publications, by separate States, or if the coal production is small in any State, by adjacent States, and to include a brief description, abstracted from the reports of the United States Geological Survey, of the geologic structure of the coal basins in the State, or group of States, as well as a brief description of the typical mining conditions in the different districts, and a statement of the production by counties as compiled by the United States Geological Survey.

Technical Paper 269 on Iowa coals was the first of the series to be issued; this paper on Virginia coals is the seventh; the others cover Kentucky, Ohio, Utah, Alabama, and Pennsylvania, the last being published by the State. From time to time the various papers will be revised to include later analyses.

SCOTT TURNER, *Director.*

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ANALYSES OF VIRGINIA COALS

THE VIRGINIA COAL FIELDS

By J. B. Eby and M. R. Campbell[1]

GEOGRAPHIC AND GEOLOGIC RELATIONS

The Virginia coal fields are widely scattered geographically (see Fig. 1) and represent deposits of widely separated geologic ages. They are known as the Southwest Virginia fields, the Valley fields, and the Richmond basin.

The Southwest Virginia fields are the most extensive and most productive in the State. They include that part of the great Appalachian bituminous coal region which lies in Lee, Wise, Scott, Dickenson, Russell, Buchanan, and Tazewell Counties. The coal beds and the associated rocks are of upper Carboniferous (Pennsylvanian) age, and the coals range in rank from high-grade bituminous to semibituminous.

The Valley fields lie farther east, in and along the Great Valley, in Montgomery, Pulaski, Wythe, and Bland Counties. The coal is of lower Carboniferous (Mississippian) age, and ranges in rank from semibituminous to semianthracite. The beds are tilted, and the area of workable coal is comparatively small.

The Richmond basin is a small field that lies only a few miles west of Richmond, and the most attractive feature of the coal is that it is more than 100 miles nearer the coast than that of the Appalachian region. The coal belongs to the Newark group of Triassic age, and is a coking coal; but at many places it has been altered to anthracite or natural coke by the heat of molten igneous rock that has cut through it and formed dikes. The coal has long been mined

SOUTHWEST VIRGINIA FIELDS

GENERAL FEATURES

The Southwest Virginia fields extend in a belt along the Kentucky border southwest from West Virginia for more than 100 miles. This belt is about 30 miles wide in Buchanan County and less than 1 mile

[1] Geologist, U. S. Geological Survey.

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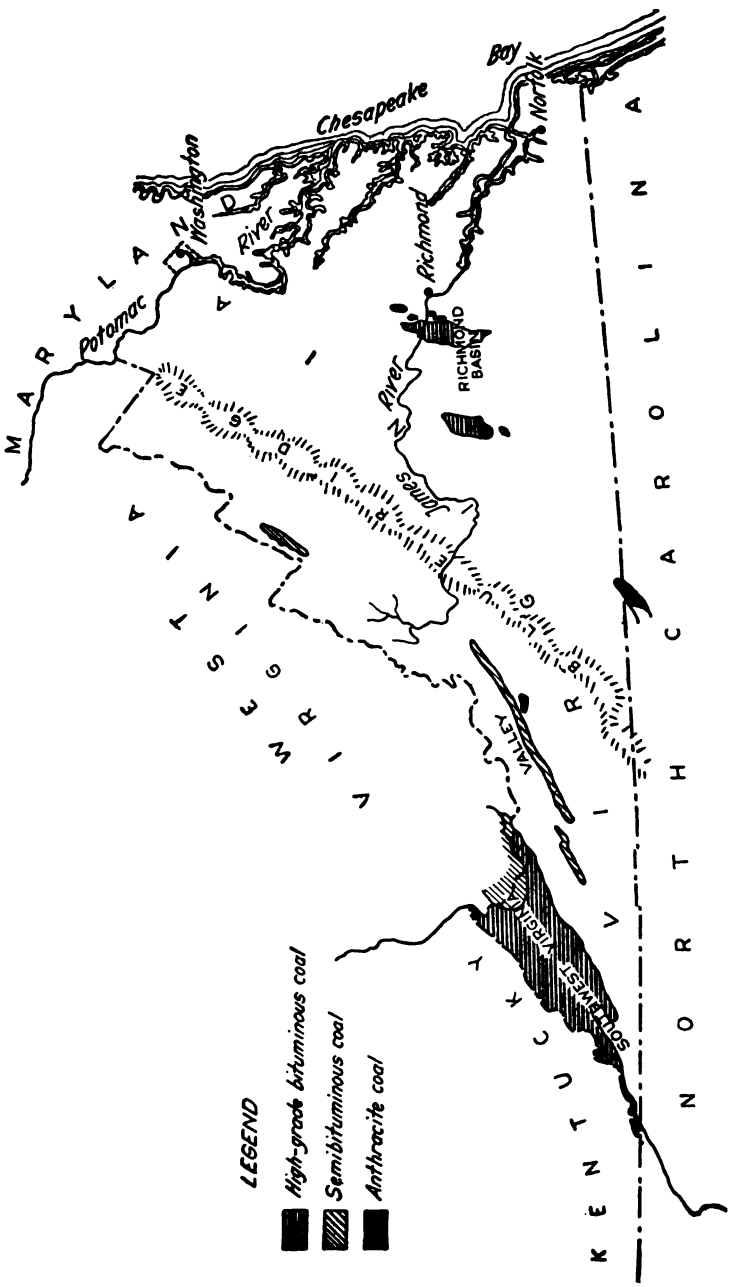

FIGURE 1.—Virginia coal fields

wide in parts of Lee County. The district may be roughly divided into two parts—the Pocahontas or Flat Top coal field at the northeast end and the Big Stone Gap coal field at the southwest end. The

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two fields are in many respects geologically alike, and will therefore be described together.

The region was originally a high plateau but has been so deeply cut by streams that little if any of its original level surface now remains. The ridges are steep and narrow crested, and their relief reaches a maximum of 3,000 feet. They have no regular trend, and at many places they are so narrow that there is scarcely room on the crest for a wagon road. The valleys also are narrow and afford little room for mining towns or railroad yards.

GEOLOGIC FORMATIONS

The rocks of the Pennsylvanian series consist mainly of beds of sandstone, shale, and coal, and the sandstone forms one-third to one-half their mass. These rocks have been divided, in ascending order, into the Pennington shale, Lee formation, Norton formation, Gladeville sandstone, Wise formation, and Harlan sandstone. The Lee formation contains two and in places three massive beds of conglomerate which are found in Lee, Wise, Scott, and Russell Counties, but not farther northeast.

The coal beds occur almost exclusively in the Lee, Norton, and Wise formations. The accompanying columnar section (Fig. 2) shows the stratigraphic relations of the formations and coal beds in the field and the approximate intervals between the more productive coal beds.

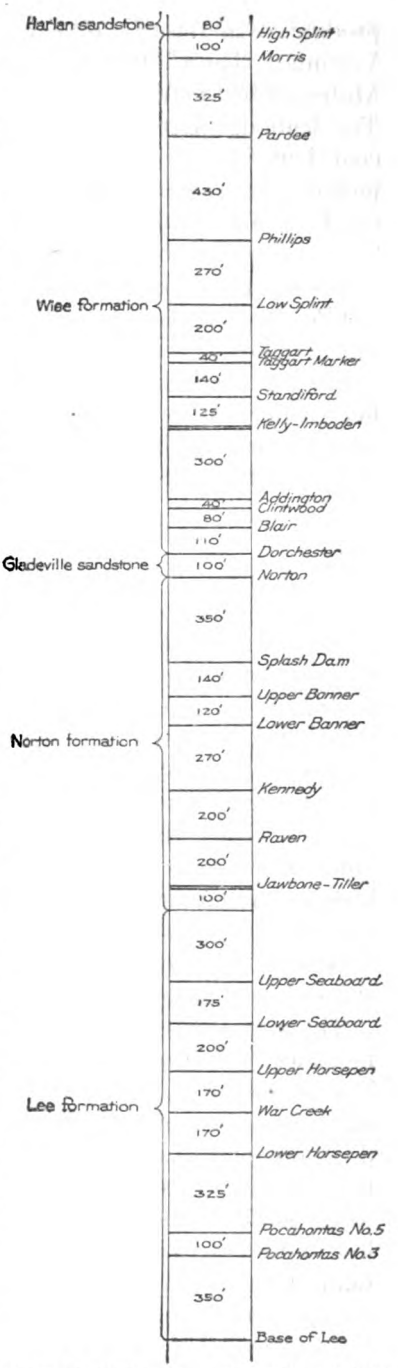

FIGURE 2.—Coal beds in southwest Virginia fields

The chief coal beds in this region are correlated with those in adjoining fields as follows: The Pocahontas bed No. 3 is well known in West Virginia, where it yields much coal. The Jawbone bed, which is highly

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productive in Wise County, is correlated with the Iaeger bed of West Virginia. The Clintwood bed is supposed to be the equivalent of the Matewan bed of West Virginia and the Feds Creek bed of Kentucky. The Imboden is regarded as the equivalent of the Campbell Creek coal bed of the Kanawha Valley. Other important correlations include the Taggart bed of Virginia with the Elkhorn of Kentucky, the Low Splint with the Amburgy, the Pardee with the Haddox or "Limestone" coal, and the High Splint with the Francis.

Among the thickest and most widely mined beds in the field are the Pocahontas No. 3, Jawbone, Upper Banner, Dorchester, Imboden, and Taggart. These beds average 5 to 10 feet in thickness, and are worked in many of the largest mines in the State. The Pocahontas bed, which has been mined since 1882, is one of the most productive beds in the Appalachian region, but its outcrop in Virginia is limited to the northeast corner of Tazewell County.

GEOLOGIC STRUCTURE

The Southwest Virginia fields lie on the southeast margin of the great structural trough of the Appalachian coal region, and the beds consequently have a general northwestward dip from the eastern margin of the trough throughout the fields; but near Russell Fork of Big Sandy River there is an anticline on the line between Virginia and Kentucky. A little farther southwest this anticline broke, and its southeast limb was forced over its northwest limb, the overthrust mass forming Pine Mountain, which extends into Tennessee. The Virginia fields that are southeast of this ridge lie in a syncline. Some other folds interrupt the general regularity of the dips of the beds in the larger structural features just described. The southeast margin of the field is formed by a great overthrust mass of rocks like that of Pine Mountain, except that they generally consist of limestone that is geologically much older than the coal-bearing rocks.

The movements in the earth's crust that deformed the rocks metamorphosed the coal, and reduced its content of volatile matter, for the heat formed by the pressure or friction due to the movement of one enormous mass of rock over or against another was great enough to drive off some of the volatile matter and leave the coal of higher rank than it was before the movement began. As the movement was due to thrust from the southeast the coals are generally metamorphosed less and less from the southeast to the northwest across the field, but many local conditions produced irregularities in the gradation of the change made. Thus in the Pocahontas field the coals lowest in volatile matter—that is, those of highest rank—are not found on the southeast margin of the field but back in the interior, near Welch, W. Va. This condition is probably due to relief of pressure by the breaking or

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faulting of the beds along the southeast margin of the field. In areas farther southwest the coals do not show a southeastward decrease in volatile matter, because they lie in a great block of the earth's crust that is broken on all sides and moved bodily before the great thrust; hence the coal in the block was not subjected to pressure great enough to affect its composition materially. In consequence of this condition most coals in the Southwest Virginia fields show little or no decrease in volatile matter or increase in rank toward the southeast.

VALLEY COAL FIELDS

The Valley coal fields include an outcrop of tilted coal-bearing rocks lying mainly in Montgomery, Pulaski, and Wythe Counties. The beds are contained in the Price formation, which is of lower Carboniferous (Mississippian) age and is about equivalent to the Pocono sandstone of Pennsylvania.

There are several coal beds in the Price formation, but only two, known as the Merrimac bed and the Langhorne bed, have been worked commercially. The Merrimac bed is 6 to 12 feet thick, but includes many bony partings, and the Langhorne bed contains 1 to 5 feet of generally clear coal.

The great pressure to which the coal has been subjected has changed it at many places from bituminous to semibituminous, and in a few places to semianthracite. In the early days of the Civil War the Merrimac mine, in Price Mountain, near Blacksburg, Montgomery County, supplied most of the coal used by the ironclad *Merrimac* in its historic fight with the *Monitor* in Hampton Roads.

RICHMOND COAL BASIN

The Richmond coal basin is a small area of coal-bearing Newark (Triassic) rocks that cross James River about 10 miles above Richmond. The beds of rock form a deep syncline or trough, which is a little more than 30 miles long and about 10 miles broad. Here three or more coal beds occur near the base of the Newark group and therefore crop out close to the boundary of the field, near the underlying gneiss, except where the boundary is marked by a fault, as it is along most of the western part of the field.

The coal of this field has been known since 1700; is said to have been mined in 1750; and is supposed to have been the first coal mined commercially within the present limits of the United States. The coal beds have in places a thickness of about 14 feet, but most of the thicker beds contain many layers of shale and bone. The normal coal contains 30 to 35 per cent of volatile matter and is an excellent coking coal. At places where it is cut by igneous dikes it has been converted to coke, and at other places it has been similarly converted to semianthracite.

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COAL PRODUCTION

Table 1 gives details [2] of coal production of this State during 1919, 1920, and 1921:

TABLE 1.—*Coal production of Virginia during 1920–1922*

County	Production (net tons)					Number of employees				Average number of days worked
	Loaded at mines for shipment	Sold to local trade and used by employees	Used at mines for steam and heat	Made into coke at mines	Total	Underground		Surface	Total	
						Miners[a]	All others			
1920										
Dickenson	594,777	5,998	14,129	.....	614,904	461	318	191	970	263
Lee	923,414	11,798	10,913	.....	946,125	777	372	328	1,477	208
Montgomery	33,359	5,751	5,140	.....	44,250	68	37	31	136	193
Russell	2,078,286	37,844	6,761	.....	2,122,891	1,085	695	409	2,189	253
Tazewell	1,270,524	25,356	27,832	.....	1,323,712	779	613	620	2,012	217
Wise	4,235,936	180,990	22,900	1,622,499	6,062,325	2,648	2,500	1,740	6,894	290
Other counties [b]	83,326	31,235	15,337	.....	129,899	119	75	138	332	272
	9,219,622	298,973	103,012	1,622,499	11,244,106	5,937	4,616	3,457	14,010	262
Small mines	134,200	300	.....	.....	134,500	.....	.....	.....	.....	.....
	9,353,822	299,273	103,012	1,622,499	11,378,606	.....	.....	.....	.....	.....
1921[c]										
Chesterfield and Pulaski	24,173	13,931	14,312	.....	52,416	78	35	41	154	258
Dickenson	433,955	4,528	9,904	.....	448,387	281	229	145	655	191
Lee	677,029	7,952	2,947	.....	687,928	748	390	253	1,391	159
Montgomery	25,368	5,752	5,610	.....	36,730	61	24	20	105	189
Russell	1,514,803	22,481	6,578	.....	1,543,862	873	597	484	1,954	171
Tazewell	1,199,618	25,455	28,829	.....	1,253,902	836	806	278	1,920	195
Wise	2,943,232	72,630	30,770	422,521	3,469,153	2,874	1,975	894	5,743	153
	6,818,178	152,729	98,950	422,521	7,492,378	5,751	4,056	2,115	11,922	166
1922										
Dickenson	845,363	10,375	14,496	.....	870,234	354	274	187	815	214
Lee	753,193	5,781	3,331	.....	762,305	714	324	252	1,290	152
Montgomery	32,634	5,110	4,450	.....	42,194	65	31	66	162	172
Russell	2,025,347	37,242	7,985	.....	2,070,574	1,023	713	553	2,289	209
Tazewell	1,508,525	25,469	29,853	.....	1,563,847	926	691	462	2,079	194
Wise	4,352,260	57,934	28,460	584,212	5,022,866	3,080	2,460	949	6,489	205
Other counties [d]	80,393	14,443	11,445	.....	106,281	128	74	73	275	132
Total, excluding wagon mines	9,597,715	156,354	100,020	584,212	10,438,301	6,290	4,567	2,542	13,399	198
Wagon mines served by rail	52,873	.....	.....	.....	52,873	.....	.....	.....	.....	.....
Grand total	9,650,588	156,354	100,020	584,212	10,491,174	.....	.....	.....	.....	.....

[a] Includes also loaders and shot firers. [b] Pulaski and Scott. [c] Exclusive of product of wagon mines. [d] Chesterfield, Pulaski and Scott.

The average value of the coal during each of the three years was $2.55, $3.99, and $3.06 per ton, respectively.

Coal production during 1922 amounted to 10,491,174 tons, and in 1923 to 11,000,000 tons.

TRANSPORTATION AND DISTRIBUTION OF VIRGINIA COALS

The coal-producing counties of the State are well served by railroad transportation lines, including the Norfolk & Western, Chesapeake & Ohio, and the C., C. & O. railroads. The coal is widely distributed. A considerable tonnage is shipped by water from Norfolk to New York and to New England ports. The coal is used for many purposes. The higher grades from the Southwest fields of the State have an enviable reputation as steam fuel.

[2] Tryon, F. G., and Hale, S. A., Coal in 1919, 1920, and 1921: U. S. Geol. Survey Mineral Resources of the United States, 1921, part II, 1923, p. 650.

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MINING METHODS IN VIRGINIA

By J. W. Paul[3]

In the Pocahontas field the double-entry room-and-pillar system was originally used, but in more recent years the panel room-and-pillar method has been adopted. In many mines the rooms and entries are driven the same width, about 15 to 18 feet, with 60 to 80 and 100 foot pillars between the rooms. These wide pillars result in increased recovery of coal within any given area.

In other parts of the State, where beds of coal other than the Pocahontas No. 3 are mined, the double-entry room-and-pillar system is in general use; the panel system is, however, used in the Dante district.

Many mines in the Lee and other thin coal beds are not extensively developed, and the recovery of coal does not compare so favorably with that from the Pocahontas No. 3 bed.

Most Virginia mines are opened by daylight drifts in the side of a valley. Drainage is mainly by gravity. Electric haulage has been introduced in the larger and many of the smaller mines and electric coal cutters are used at most mines for mining the coal.

Black blasting powder is the explosive most commonly used in the majority of mines, and gas or coal-dust explosions have been rare, except in mines working the Pocahontas No. 3 bed.

The total extraction of coal in Virginia averages 80 per cent, and the avoidable loss is only 5 per cent.[4]

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[3] Chief coal-mining engineer, Bureau of Mines.

[4] Nature and amount of losses in mining bituminous coal: Report of Bureau of Mines to U. S. Coal Commission, 1923.

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ANALYSES OF MINE SAMPLES

By A. C. Fieldner,[5] H. M. Cooper,[6] and F. D. Osgood [7]

The analyses in Table 2 are arranged geographically with respect to counties and towns, and are grouped as follows:

1. The proximate analysis—moisture, volatile matter, fixed carbon, and ash.
2. The ultimate analysis—carbon, hydrogen, nitrogen, oxygen, sulphur, and ash.
3. The calorific value of heat of combustion.
4. The softening temperature of ash, when such determinations were made.

Ultimate analyses are given in three conditions: (1) As received; (2) moisture free; and (3) moisture and ash free. Proximate analyses and heating values are given in two conditions: (1) As received and (2) moisture free.

The as-received condition represents the sample as received at the laboratory, while the moisture-free condition represents the composition and heating value of the dry coal. The moisture and ash free condition represents approximately the composition and calorific value of the dry combustible matter.

SOURCES OF INFORMATION

Table 2 contains chemical analyses of coal from mines and prospects collected at various times in the course of systematic surveys of the coal resources of the State by geologists of the United States Geological Survey, engineers of the United States Bureau of Mines, and geologists of the Virginia Geological Survey. These analyses have been copied from various published reports of the Bureau of Mines and the Geological Survey, including all analyses to July 1, 1922, which have not been published before. The analyses and calorimetric determinations were made in the laboratories of these bureaus by the standard methods described in Technical Paper 8.[8]

The analyses are given to the nearest 0.1 per cent, and the British thermal units to the nearest 10, although the laboratory determinations are made to the nearest 0.01 per cent and the British thermal units to the nearest unit.

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[5] Superintendent, Pittsburgh experiment station, Bureau of Mines.

[6] Assistant chemist, Pittsburgh station.

[7] Assistant chemist, Pittsburgh station.

[8] Stanton, F. M., and Fieldner, A. C., Methods of analyzing coal and coke: Tech. Paper 8, Bureau of Mines, 1913, 42 pp.

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Column 18 of Table 2 gives the number of the Bureau of Mines bulletin in which will be found the description of the mine and data regarding the section of the bed from which the sample was cut. Column 19 gives the page number of this technical paper in which similar data may be found for those samples that are now published for the first time.

FUSIBILITY OF ASH

In general, the softening temperature of coal ash from the coals of the United States [9] ranges from 1,900° to 3,100° F. For convenience, the order of fusibility may be expressed by subdividing this range of softening temperature into three groups as follows:

Class I. Refractory ash, softening above 2,600° F.
Class II. Ash of medium fusibility, softening between 2,200° and 2,600° F.
Class III. Easily fusible ash, softening below 2,200° F.

The softening temperature is defined as the temperature at which a cone of the ash, when heated in the test furnace with a slightly reducing atmosphere, has fused down to a spherical lump.

The Bureau of Mines has determined the softening temperature of ash of a large number of coals in the United States. The Virginia coals which were tested gave a wide range of fusibility, from the easily fusible class III to the refractory class I.

The highly refractory class I ash is found mainly in the No. 1, No. 2–A, No. 6, No. 7, Kelly, Lee, and Pardee beds of Lee and Wise Counties; the Splash Dam and Clintwood beds of Dickenson County; the Mohawk bed of Buchanan County; and also the "Large" and "Small" beds when worked by some mines in Montgomery and Pulaski Counties. The easily fusible class III ash occurs chiefly in Lee County, from the No. 2, 3, 4, and 5, Stone Creek, North Fork, Wilson, and Glamorgan beds, although low-fusible ash is found in all of the coal fields.

The majority of the samples tested fall in the medium fusible group of class II. The Kennedy bed is in the lower part of this group, ranging from 2,150° to 2,400° F.; while the Upper and Lower Banner beds are about the upper and lower parts of this group. The remaining beds, especially in Tazewell and Wise Counties, are principally found in the upper part of class II, although some samples from the Imboden and Jawbone beds are found in class I.

The actual temperatures observed are given in column 17, Table 2.

[9] Selvig, W. A., and Fieldner, A. C., Fusibility of ash from coals of the United States: Bull. 209, Bureau of Mines, 1922, 119 pp.

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TABLE 2.—*Analyses of mine samples*

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.) [c]	Reference [d]	
	Laboratory No.	Kind [a]	Condition [b]	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
BUCHANAN COUNTY																		
Big Rock; Oliver Elswick mine (face, 60 feet north, 70° east of opening).	19735	B	1	3.4	28.2	61.4	7.0	0.7	5.1	78.3	1.5	7.4	2.0	7,672	13,810	3,010	123	
			2		29.2	63.6	7.2	.7	4.9	81.1	1.6	4.5		7,939	14,290			
			3		31.4	68.6		.7	5.3	87.4	1.7	4.9		8,561	15,410			
Blackey, 1 mile southeast of; Blackey mine, Mohawk bed (face, 450 feet east of main entrance).	19833	B	1	4.1	31.7	61.2	3.0	1.1	5.4	80.9	1.5	8.1	3.2	8,167	14,470	2,260	123	
			2		33.1	63.8	3.1	1.1	5.1	84.3	1.6	4.8		8,378	15,080			
			3		34.1	65.9		1.2	5.3	87.0	1.6	4.9		8,644	15,560			
Same (525 feet south 80° east of main entrance)	19834	B	1	3.5	31.9	60.9	3.7	1.5	5.3	80.9	1.5	7.1	2.7	7,994	14,390	2,060	123	
			2		33.1	63.0	3.9	1.5	5.1	83.8	1.6	4.1		8,289	14,920			
			3		34.4	65.6		1.6	5.3	87.2	1.7	4.2		8,622	15,520			
Whitewood; Whitewood mine (600 feet southwest of main entrance).	19924	B	1	2.4	19.6	64.6	13.4	.7					1.7	7,311	13,160	3,010	123	
			2		20.0	66.3	13.7	.7						7,489	13,480			
DICKENSON COUNTY																		
Clintwood; Chase & Damron mine, Clintwood bed (150 feet from entry mouth).	3827	B	1	2.2	30.1	63.7	4.0	.9					1.2				22	
			2		30.8	65.1	4.1	.9										
3 miles southeast of; Elbert Powers mine, Clintwood (?) bed (in main entry, 20 feet from mine mouth).	14767	B	1	4.3	29.4	62.1	4.2	1.0					3.3				85	
			2		30.7	64.9	4.4	1.1										
Near; Yeates mine, Clintwood bed (at end of 1 right entry, main entry, 100 feet from main entry).	14766	B	1	2.2	34.2	60.4	3.2	.9					1.2	8,106	14,590	2,670	85	
			2		35.0	61.7	3.3	.9						8,289	14,920			
Mart, 1 mile northeast of; C. C. Owen's mine, Splash Dam bed (10 feet north of main drift, 75 feet east of mine mouth).	17751	B	1	2.3	29.4	62.2	6.1	.8					1.3			2,750	123	
			2		30.1	63.6	6.3	.8										
Same (15 feet south of main entry, 75 feet east of mine mouth).	17752	B	1	2.5	29.2	63.1	5.2	.8					1.6			2,690	123	
			2		30.0	64.7	5.3	.8										
Nora, 10 miles northwest of Dante; Nora Mills mine, Widow Kennedy bed (100 yards east of mine mouth).	17559	B	1	2.7	25.5	60.9	10.9	.7					1.8	7,467	13,440	2,360	123	
Same (100 yards northeast of mine mouth)	17560	B	1	2.7	26.0	63.1	8.2	.7					1.7	7,728	13,910	2,130	123	
Same (composite of samples 17559 and 17560)	17561	B	1	2.6	26.2	61.7	9.5	.7	4.8	77.6	1.6	5.8	1.8	7,578	13,640		123	
			2		26.9	63.4	9.7	.8	4.6	79.7	1.6	3.6		7,783	14,010			
			3		29.7	70.3		.8	5.1	88.3	1.8	4.0		8,622	15,520			

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Prater (Buchanan County), 4 miles northwest of; Yellow Poplar mine, Upper Banner bed (200 feet east of mine mouth).	17743	B	1	2.8	31.6	58.0	7.6	1.6	------	------	------	------	1.7	7,689	13,840	2,630	123	------
			2	------	32.5	59.8	7.7	1.5	------	------	------	------	------	7,906	14,230	------	------	------
Same (220 feet north 85° east of mine mouth)	17744	B	1	3.0	32.4	58.4	6.2	1.6	------	------	------	------	1.8	7,794	14,030	2,430	123	------
			2	------	33.4	60.2	6.4	1.7	------	------	------	------	------	8,033	14,460	------	------	------
Trammel, ¼ mile east of; Banner No. 2 mine, Upper Banner bed (face of 2 right entry, 1 right main entry, 1,200 feet north 75° east of mine mouth).	82438	A	1	2.1	30.8	61.0	6.1	1.0	------	------	------	------	1.5	7,894	14,210	2,340	------	31
Same (face of last crosscut, 1 right main entry, 1,700 feet north 55° east of mine mouth).	82439	A	1	2.4	31.2	60.5	5.9	.9	------	------	------	------	1.8	7,872	14,170	2,450	------	------
Same (rib near face, 2 right main entry, 1,200 feet north 30° east of mine mouth).	82440	A	1	2.3	31.0	61.2	5.5	.9	------	------	------	------	1.7	7,944	14,300	2,450	------	------
Same (manhole, 200 feet from face of entry, 1,200 feet north of mine mouth).	82441	A	1	2.2	33.3	58.5	6.0	1.3	------	------	------	------	1.7	7,906	14,230	2,510	------	------
Same (composite of samples 82438 to 82441, inclusive).	82442	A	1	2.2	31.8	60.1	5.9	.8	5.3	79.9	1.6	6.5	1.7	7,889	14,200	------	------	------
			2	------	32.6	61.3	6.1	.9	5.2	81.8	1.6	4.4	------	8,067	14,520	------	------	------
			3	------	34.7	65.3	------	.9	5.5	87.0	1.7	4.9	------	8,589	15,460	------	------	------
HENRICO COUNTY																		
Gayton, 1 mile from, 5 miles north of Lorraine; Carboh Hill mine, C bed (in main gangway, opposite 45 room).	15050	A	1	2.8	25.7	62.5	9.0	1.4	4.9	76.6	1.8	6.3	1.9	7,494	13,490	2,160	85	------
			2	------	26.4	64.3	9.3	1.5	4.7	78.8	1.9	3.8	------	7,711	13,880	------	------	------
			3	------	29.1	70.9	------	1.6	5.2	86.8	2.1	4.3	------	8,500	15,300	------	------	------
Same (main gangway, opposite 32 room)	15052	A	1	2.5	16.3	70.3	10.9	1.3	------	------	------	------	1.9	------	------	2,250	85	------
			2	------	16.7	72.1	11.2	1.3	------	------	------	------	------	------	------	------	------	------
B bed (face of right gangway, 3 slope, 20 feet beyond 21 room).	15051	A	1	2.1	23.6	56.9	17.4	2.2	4.4	69.2	1.6	5.2	1.4	6,778	12,200	2,420	85	------
			2	------	24.1	58.2	17.7	2.2	4.3	70.7	1.6	3.5	------	6,922	12,460	------	------	------
			3	------	29.3	70.7	------	2.7	5.2	86.0	2.0	4.1	------	8,417	15,150	------	------	------
LEE COUNTY																		
Crab Orchard; Morris prospect, Wilson bed (entire bed of left rib, 29 feet from outcrop).	2246	A	1	4.7	34.2	56.5	4.6	2.6	------	------	------	------	2.6	------	------	------	22	------
			2	------	35.9	59.2	4.9	2.7	------	------	------	------	------	------	------	------	------	------
Same (lower bench at face of drift)	2268	A	1	5.7	34.4	51.8	8.1	2.3	------	------	------	------	4.2	7,289	13,120	------	22	------
			2	------	36.5	54.9	8.6	2.5	------	------	------	------	------	7,728	13,910	------	------	------
Same (upper bench at face of drift)	2269	A	1	6.6	33.5	55.5	4.4	.8	------	------	------	------	4.4	------	------	------	22	------
			2	------	35.9	59.4	4.7	.9	------	------	------	------	------	------	------	------	------	------
Near "Big Opening" on Wilson farm, McConnell bed (lower bench, 75 feet from outcrop)	2249	A	1	6.8	33.0	58.3	1.9	.7	------	------	------	------	5.0	------	------	------	22	------
			2	------	35.4	62.5	2.1	.7	------	------	------	------	------	------	------	------	------	------
Same (upper bench)	2248	A	1	3.9	34.1	56.9	5.1	.9	------	------	------	------	1.9	7,706	13,870	------	22	------
			2	------	35.5	59.2	5.3	.9	------	------	------	------	------	8,022	14,440	------	------	------
Darby; Darby mine, Darby bed (face of 1 room, 3 butt entry, 901 feet from mine mouth).	2324	A	1	3.6	37.1	56.8	2.5	.5	------	------	------	------	1.5	------	------	------	22	------
			2	------	38.4	59.0	2.6	.5	------	------	------	------	------	------	------	------	------	------
Same (18 room, 1 butt entry, 1,423 feet from mine mouth).	2323	A	1	3.9	34.9	58.1	3.1	.3	------	------	------	------	1.9	7,861	14,150	------	22	------
			2	------	36.3	60.5	3.2	.4	------	------	------	------	------	8,178	14,720	------	------	------
Darbyville; Black Mountain mine on Bailey Trace, No. 5 (Darby) bed (100 feet from opening).	6236	B	1	3.4	34.4	58.8	3.4	.6	5.3	78.0	1.3	11.4	1.4	7,850	14,130	------	22	------
			2	------	35.6	60.9	3.5	.6	5.6	80.7	1.3	8.9	------	8,128	14,630	------	------	------
			3	------	36.9	63.1	------	.6	5.2	83.7	1.4	9.1	------	8,428	15,170	------	------	------

[a] Kind of sample is denoted by letter as follows: A is mine sample collected by an inspector of the Bureau of Mines; B is mine sample collected by a geologist of the United States Geological Survey.

[b] The form of analysis is denoted by number as follows: 1, Sample as received; 2, dried at a temperature of 105° C.; 3, moisture and ash free.

[c] This column denotes the temperature at which a cone of the coal ash will fuse to a spherical lump when heated in a furnace.

[d] The numbers in column 18 refer to the Bureau of Mines bulletins in which may be found the description of the section of the bed from which the sample was taken. The numbers in column 19 refer to the page of this paper where may be found the description of the mine and section from which the sample was taken.

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (°F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LEE COUNTY—continued																		
Darbyville; Darby mine, Taggart bed (8 face of aircourse, 20 butt entry, 3,900 feet east of mine mouth).	82433	A	1	4.1	36.6	57.4	1.9	0.4	.....	.....	.....	.....	2.3	7,817	14,070	2,110	.....	31
Same (face of 6 entry, 20 butt entry, 3,600 feet south, 60° east of mine mouth).	82434	A	1	4.2	36.9	57.2	1.7	.4	.....	.....	.....	.....	2.3	7,817	14,070	2,220	.....	.....
Same (face of 9 right, 2 panel wall, 3,500 feet south, 20° east of mine mouth).	82435	A	1	4.1	37.5	56.7	1.7	.4	.....	.....	.....	.....	2.4	7,861	14,150	2,220	.....	.....
Same (pillar of 6 room, 1 main entry, 1,000 feet east of mine mouth).	82436	A	1	3.4	37.2	57.3	2.1	.5	.....	.....	.....	.....	1.4	7,822	14,080	2,180	.....	.....
Same (composite of samples 82433 to 82436 inclusive).	82437	A	1	4.0	36.8	57.3	1.9	.5	5.7	79.1	1.4	11.4	2.1	7,811	14,060	.....	.....	.....
			2	.....	38.3	59.7	2.0	.5	5.5	82.4	1.5	8.1	.....	8,133	14,640	.....	.....	.....
			3	.....	39.1	60.9	.....	.5	5.6	84.1	1.5	8.3	.....	8,300	14,940	.....	.....	.....
Gin Creek opening, No. 9 bed	6238	B	1	4.4	36.0	53.6	6.0	.8	5.2	72.0	1.3	14.7	2.1	7,422	13,360	.....	22	.....
			2	.....	37.7	56.0	6.3	.8	4.9	75.3	1.3	11.4	.....	7,767	13,980	.....	.....	.....
			3	.....	40.2	59.8	.....	.9	5.3	80.3	1.4	12.1	.....	8,289	14,920	.....	.....	.....
Gin Creek prospect, No. 10 bed (face of opening)	6237	B	1	5.3	32.7	53.2	8.8	.8	5.1	70.4	1.4	13.5	3.1	7,100	12,780	.....	22	.....
			2	.....	34.5	56.2	9.3	.8	4.8	74.3	1.4	9.4	.....	7,500	13,500	.....	.....	.....
			3	.....	38.0	62.0	.....	.9	5.3	82.0	1.6	10.2	.....	8,267	14,880	.....	.....	.....
No. 12 bed	6239	B	1	5.5	36.0	51.9	6.6	1.2	5.2	71.5	1.1	14.4	3.1	7,283	13,110	.....	22	.....
			2	.....	38.1	54.9	7.0	1.3	4.9	75.6	1.2	10.0	.....	7,706	13,870	.....	.....	.....
			3	.....	41.0	59.0	.....	1.4	5.2	81.3	1.3	10.8	.....	8,283	14,910	.....	.....	.....
Keokee; Mohawk Coal Co., No. 2 mine, Mohawk bed (face of 1 room, straight main entry, 3,500 feet east-northeast of mine mouth).	75747	B	1	2.9	36.0	54.5	6.6	.9	.....	.....	.....	.....	1.2	7,561	13,610	2,680	.....	32
Mohawk Coal Co., No. 1 mine, Mohawk bed (main dip heading, 1,200 feet northeast of mine mouth).	75748	B	1	3.4	35.2	54.8	6.6	.8	.....	.....	.....	.....	1.8	7,494	13,490	2,630	.....	32
Same (composite of samples 75747 and 75748)	75749	B	1	3.3	35.1	55.1	6.5	.8	5.4	76.0	1.7	9.6	1.5	7,533	13,560	.....	.....	.....
			2	.....	36.2	57.0	6.8	.9	5.2	78.5	1.7	6.9	.....	7,783	14,010	.....	.....	.....
			3	.....	38.9	61.1	.....	.9	5.5	84.2	1.9	7.5	.....	8,350	15,030	.....	.....	.....
Stonega Coke & Coal Co. mine No. 1, Taggart bed (21 room, 5 right entry, 4 main entry, 4,000 feet northwest of mine mouth), Virginia side of mine.	75679	B	1	2.9	35.3	57.4	4.4	.8	.....	.....	.....	.....	.8	7,800	14,040	2,570	.....	33

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Same (14 room, 10 left entry, 2 main entry, 4,000 feet northwest of mine mouth, 600 feet on the Kentucky side of State line).	75678	B	1	3.6	34.1	57.7	4.6	.7					1.8	7,639	13,750	2,450		
Same (composite of samples 75678 and 75679)	75680	B	1	3.2	34.7	57.5	4.6	.8	5.5	78.0	1.4	9.7	1.3	7,739	13,930			
			2		35.9	59.4	4.7	.8	5.3	80.5	1.5	7.2		7,989	14,380			
			3		37.7	62.3		.8	5.5	84.5	1.5	7.7		8,389	15,100			
Stonega Coke & Coal Co. mine No. 3, Harlan bed (face of 5 room, 3 left entry, 2 main entry, 500 feet northwest of mine mouth).	75675	B	1	2.4	39.5	53.5	4.6	2.4					.7	7,800	14,040	2,110		33
Same (in east main aircourse heading, 3,200 feet northwest of mine mouth).	75676	B	1	2.7	40.8	51.0	5.5	2.2					1.1	7,632	13,810	2,020		
Same (composite of samples 75675 and 75676)	75677	B	1	2.5	39.8	52.6	5.1	2.3	5.5	77.3	1.3	8.5	.9	7,744	13,940			
			2		40.8	54.0	5.2	2.4	5.3	79.2	1.3	6.6		7,944	14,300			
			3		43.1	56.9		2.5	5.6	83.5	1.4	7.0		8,378	15,080			
Pennington Gap; Penn Lee No. 1 mine, Black Mountain bed (face of 3 left entry, main heading, 150 feet from 3 room, 1,000 feet northeast of mine mouth).	34978	B	1	2.7	37.7	54.0	5.6	.8	5.5	76.4	1.9	9.8	.8	7,556	13,600	2,800		34
			2		38.7	55.6	5.7	.8	5.3	78.5	1.9	7.8		7,761	13,970			
			3		41.1	58.9		.8	5.6	83.3	2.0	8.3		8,233	14,820			
Penn Lee No. 4 mine, Black Mountain bed (face of main heading, 200 feet northeast of mine mouth).	34979	B	1	3.1	38.3	54.7	3.9	.7	5.5	77.6	1.9	10.4	1.0	7,683	13,830	2,710		35
			2		39.5	56.5	4.0	.7	5.3	80.0	1.9	8.1		7,928	14,270			
			3		41.2	58.8		.8	5.6	83.3	2.0	8.3		8,256	14,860			
3 miles northwest of; Stone Creek Coal Co. No. 1 mine, Stone Creek bed (main heading, 150 feet north-northwest of mine mouth).	75905	B	1	3.0	40.3	52.1	4.6	1.9					.7	7,594	13,670			35
			2		41.5	53.7	4.8	2.0						7,828	14,090			
3 miles northeast of; Virginia Blue Gem Coal Corporation No. 1 mine, North Fork bed (1 room, 1 right entry, main entry, 400 feet northeast of mine mouth).	75907	B	1	3.2	38.5	56.1	2.2	1.7					.9	7,811	14,060	2,060		36
			2		39.8	57.9	2.3	1.8						8,067	14,520			
3½ miles north of; Emerald Coal Co., No. 1 mine, Harlan bed (face of main heading, 1 entry 500 feet south-southeast of mine mouth).	75787	B	1	3.2	38.2	48.6	10.0	3.7					1.3	7,072	12,730	2,280		36
			2		39.5	50.2	10.3	3.9						7,311	13,160			
Pocket, 2 miles east of; Reed Creek Coal Association mine (face of 1 slant entry).	29684	A	1	1.8	39.4	50.2	8.6	3.4					.7	7,528	13,550	2,250	193	
Same (face of 3 slant entry)	29685	A	1	2.1	39.7	48.8	9.4	3.7					1.1	7,389	13,300	2,140	193	
Same (composite of samples 29684 and 29685)	29686	A	1	1.9	39.9	49.2	9.0	3.5	5.4	73.1	1.5	7.5	.9	7,467	13,440		193	
			2		40.7	50.2	9.1	3.6	5.2	74.6	1.5	6.0		7,617	13,710			
			3		44.8	55.2		4.0	5.8	82.1	1.7	6.4		8,378	15,080			
St Charles; Black Diamond No. 1 mine, Jack Rock (No. 3) bed (heading of 2 right entry, main entry, 600 feet northeast of mine mouth).	34981	B	1	2.4	36.1	47.6	13.9	2.7	5.0	68.2	1.4	8.8	.9	6,844	12,320	2,470		37
			2		37.0	48.8	14.2	2.8	4.8	69.9	1.4	6.9		7,011	12,620			
			3		43.2	56.8		3.2	5.6	81.5	1.6	8.1		8,172	14,710			
St. Charles Coal Co. No. 1 mine, Standiford bed (heading of main entry, 350 feet southeast of mine mouth).	75906	B	1	3.3	33.1	53.7	9.9	.6					.8	7,144	12,860	3,000		37
			2		34.2	55.5	10.3	.6						7,389	13,300			
Virginia Lee No. 1 mine, Taggart bed (face of 19 room, 10 left entry, 1 main entry, 500 feet west-northwest of mine mouth).	34980	B	1	2.8	37.0	56.9	3.3	.5	5.4	78.7	1.5	10.6	.7	7,739	13,930	2,100		38
			2		38.1	58.5	3.4	.6	5.3	80.9	1.5	8.3		7,961	14,330			
			3		39.4	60.6		.6	5.5	83.8	1.5	8.6		8,244	14,840			
1 mile northeast of; Bondurant No. 3 mine, Taggart or Darby bed (rib at face of 5 entry, 500 feet southwest of mine mouth).	82423	A	1	4.1	36.3	56.4	3.2	.5					2.6	7,672	13,810	2,390		38
Same (rib at face, crosscut, 4 entry, 200 feet south of mine mouth).	82424	A	1	4.1	36.2	56.1	3.6	.4					2.5	7,622	13,720	2,680		
Same (rib at face of 3 cross entry, 400 feet southeast of mine mouth).	82425	A	1	4.3	36.0	57.7	2.0	.5					2.7	7,772	13,990	2,620		

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LEE COUNTY—continued																		
St. Charles; 1 mile northeast of; Bondurant No. 3 mine, Taggart or Darby bed (rib at face of 2 entry, 500 feet northeast of mine mouth).	82426	A	1	3.8	36.6	57.5	2.1	0.4	.....	.....	.....	.....	2.0	7,806	14,050	2,230	.....	38
Same (composite of samples 82423 to 82426 inclusive).	82427	A	1	4.2	36.0	57.1	2.7	.5	5.7	78.1	1.4	11.6	2.5	7,717	13,890	.....	.....	.....
			2	.....	37.5	59.6	2.9	.5	5.4	81.5	1.5	8.2	.....	8,050	14,490	.....	.....	.....
			3	.....	38.6	61.4	.....	.6	5.6	83.9	1.5	8.4	.....	8,289	14,920	.....	.....	.....
1 mile northwest of; Dominion mine, Taggart bed (rib, near face of 8 left entry, 3 main entry, 3,300 feet north, 15° east of mine mouth).	82428	A	1	3.4	36.5	57.7	2.4	.4	.....	.....	.....	.....	1.6	7,856	14,140	2,200	.....	39
Same (face of cross haulageway, 1 right entry, 1 main entry, 2,900 feet north, 10° west of mine mouth).	82429	A	1	3.2	37.1	57.2	2.5	.4	.....	.....	.....	.....	1.4	7,839	14,110	2,130	.....	.....
Same (face of 8 right entry, 1 main entry, 3,000 feet north of mine mouth).	82430	A	1	3.4	36.9	57.0	2.7	.5	.....	.....	.....	.....	1.6	7,833	14,100	2,090	.....	.....
Same (face of 1 right room, 7 left entry, 1 main entry, 2,900 feet north, 30° west of mine mouth).	82431	A	1	3.5	36.5	57.7	2.3	.5	.....	.....	.....	.....	1.7	7,811	14,060	2,040	.....	.....
Same (composite of samples 82428 to 82431 inclusive).	82432	A	1	3.3	37.1	57.2	2.4	.5	5.7	79.3	1.5	10.6	1.6	7,822	14,080	.....	.....	.....
			2	.....	38.4	59.2	2.4	.5	5.5	82.0	1.6	8.0	.....	8,094	14,570	.....	.....	.....
			3	.....	39.3	60.7	.....	.5	5.6	84.0	1.6	8.3	.....	8,294	14,930	.....	.....	.....
1½ miles west of; Freeheart Coal Co. No. 1 mine, Standiford bed (face of 1 room, main entry, 60 feet west of mine mouth).	75908	B	1	3.6	31.9	53.1	11.4	.6	.....	.....	.....	.....	.7	6,961	12,530	3,000	.....	39
			2	.....	33.1	55.1	11.8	.6	.....	.....	.....	.....	.....	7,217	12,990	.....	.....	.....
1½ miles east of; Tomlinson & Pearly No. 1 mine, No. 2 bed (face of 1 left entry, from rib of main entry, 150 feet northwest of mine mouth).	75909	B	1	2.8	38.0	53.5	5.7	2.1	.....	.....	.....	.....	.7	7,528	13,550	2,110	.....	40
			2	.....	39.1	55.0	5.9	2.1	.....	.....	.....	.....	.....	7,750	13,950	.....	.....	.....
2 miles north of; Kirk mine, Taggart bed (pillar, 3 room, 1 right entry, 1 left main entry, 600 feet north of mine mouth).	82418	A	1	3.3	36.4	58.5	1.8	.4	.....	.....	.....	.....	1.9	7,850	14,130	2,240	.....	40
Same (rib, near face, 4 right, main entry, 500 feet north, 15° east of mine mouth).	82419	A	1	3.4	36.6	58.2	1.8	.4	.....	.....	.....	.....	2.1	7,878	14,180	2,240	.....	.....

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Same (face of 4 room, crosscut, 2 right entry, 1 left main entry, 900 feet north of mine mouth)	82420	A	1	3.4	37.1	57.0	2.5	.5					2.1	7,811	14,060	2,180		
Same (face of 2 main entry, 800 feet south of No. 1 mine mouth).	82421	A	1	3.8	35.9	58.2	2.1	.5					2.3	7,817	14,070	2,240		
Same (composite of samples, 82418 to 82421 inclusive).	82422	A	1	3.6	36.7	57.6	2.1	.5	5.7	79.0	1.4	11.3	2.1	7,839	14,110			
			2		38.1	59.8	2.1	.5	5.5	81.9	1.5	8.5		8,133	14,640			
			3		38.9	61.1		.5	5.6	83.7	1.5	8.7		8,317	14,970			
2½ miles northeast of; Old Virginia Coal Co. No. 3 mine, Taggart bed (face of 3 room, 1 left entry, main entry, 500 feet northeast of mine mouth).	75792	B	1	3.1	38.4	55.4	3.1	.6					1.0	7,856	14,140	2,110		41
Same (face of 6 room, 6 left entry, main entry, 1 mile northeast of mine mouth)	75793	B	1	3.8	37.7	56.3	2.2	.8					1.5	7,817	14,070	2,110		
Same (composite of samples 75792 and 75793)	75794	B	1	3.4	38.1	55.9	2.6	.8	5.6	78.8	1.5	10.7	1.2	7,811	14,060			
			2		39.4	57.9	2.7	.8	5.4	81.6	1.6	7.9		8,089	14,560			
			3		40.5	59.5		.8	5.6	83.8	1.6	8.2		8,311	14,960			
2½ miles south of; Puckett Creek Coal Co. No. 1 mine, Harlan bed (heading of main entry, 400 feet southwest of mine mouth).	75788	B	1	3.3	38.1	50.0	8.6	2.8					1.4	7,244	13,040	2,330		42
			2		39.4	51.7	8.9	2.9						7,489	13,480			
3 miles northeast of; Virginia Iron, Coal & Coke Co. No. 2 mine, Low Splint bed (heading of main entry, 1 mile north-northwest of mine mouth).	75807	B	1	3.3	35.2	52.1	9.4	1.0					1.1	7,106	12,790	2,640		42
No. 3 mine (heading of main entry, 1,200 feet northwest of mine mouth).	75806	B	1	3.7	35.1	54.3	6.9	1.1					1.4	7,400	13,320	2,630		42
Same (composite of samples 75807 and 75806)	75808	B	1	3.5	35.2	53.2	8.1	1.1	5.2	73.2	1.7	10.7	1.2	7,261	13,070			
			2		36.5	55.2	8.3	1.1	5.0	75.9	1.8	7.9		7,522	13,540			
			3		39.8	60.2		1.2	5.4	82.8	1.9	8.7		8,206	14,770			
4½ miles north-northeast of; Benedict No. 1 mine, Phillips bed (heading of main entry, 2,500 feet east-northeast of mine mouth).	75789	B	1	3.8	36.6	53.2	6.4	.8					1.5	7,406	13,330	2,660		43
Same (heading of 1 left entry, main entry, 2,000 feet north-northwest of mine mouth).	75790	B	1	3.7	34.4	52.0	9.9	.7					1.2	7,078	12,740	2,950		
Same (composite of samples 75789 and 75790)	75791	B	1	3.7	35.5	52.8	8.0	.8	5.1	73.1	1.8	11.2	1.4	7,233	13,020			
			2		36.9	54.7	8.4	.8	4.9	76.0	1.9	8.0		7,511	13,520			
			3		40.3	59.7		.9	5.3	82.9	2.0	8.9		8,200	14,760			
MONTGOMERY COUNTY																		
Blacksburg, 3½ miles northwest of; Clements Hollow mine, Small bed (100 feet inside mouth of abandoned drift).	19359	B	1	3.2	11.4	43.8	41.6	.3	2.9	48.0	.8	6.4	2.2	4,456	8,020	3,010	123	
			2		11.8	45.2	43.0	.3	2.6	49.6	.8	3.7		4,606	8,290			
			3		20.6	79.4		.6	4.6	87.0	1.4	6.4		8,078	14,540			
3½ miles north of; Slusser mine, Large bed (900 feet west on main entry, 25 feet north on side entry).	19358	B	1	1.9	12.3	66.8	19.0	.7	3.5	72.3	.9	3.6	1.1	6,756	12,160	2,360	123	
			2		12.6	68.1	19.3	.7	3.4	73.7	.9	2.0		6,883	12,390			
			3		15.6	84.4		.8	4.2	91.4	1.1	2.5		8,533	15,360			
Same (along airway, 25 feet northeast of main entry, 350 yards from mine mouth).	22629	B	1	1.6	12.3	68.1	18.0	.5					.4	6,856	12,340	2,430	123	
			2		12.5	69.2	18.3	.5						6,967	12,540			
Same	22630	B	1	1.9	13.5	69.8	14.8	.6					.6	7,061	12,710	2,440	123	
			2		13.8	71.1	15.1	.6						7,000	12,600			
Same	22631	B	1	1.8	11.8	53.5	32.9	.3					.8	3,889	9,780		123	
			2		12.0	54.5	33.5	.3						5,533	9,960			

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TABLE 2—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MONTGOMERY COUNTY—continued																		
Blacksburg, 3½ miles north of; Slusser mine, Big Vein bed (220 feet down slope and 100 feet northeast on level).	30689	B	1	2.1	13.9	68.7	15.3	0.6					1.4	7,006	12,610	2,260	193	
Same (225 feet down slope and 200 feet southwest on level).	30690	B	1	1.7	14.1	69.4	14.8	.5					1.0	7,139	12,850		193	
Same (composite of samples 30689 and 30690)	30691	B	1	1.9	14.0	68.9	15.2	.5	3.6	75.3	.9	4.5	1.2	7,078	12,740		193	
			2		14.3	70.2	15.5	.5	3.4	76.8	.9	2.9		7,217	12,990			
			3		16.9	83.1		.6	4.1	90.8	1.1	3.4		8,533	15,360			
4 miles northwest of; Plunkett & Wall mine, Large bed (down slope, 300 feet northeast, 100 feet along entry).	19357	B	1	2.5	12.4	67.5	17.6	.5	2.6	72.8	.9	4.6	1.9	6,867	12,360	3,010	123	
			2		12.7	69.2	18.1	.5	3.4	74.7	.9	2.4		7,044	12,680			
			3		15.5	84.5		.6	4.2	91.2	1.1	2.9		8,600	15,480			
5 miles northwest of; Seymour Price mine, Large bed (350 feet down main slope, 150 feet northeast along bottom level).	19360	B	1	4.7	11.5	65.4	18.4	.6	3.7	70.2	.9	6.2	3.9	6,567	11,820	2,960	123	
			2		12.1	68.5	19.4	.6	3.3	73.6	.9	2.2		6,894	12,410			
			3		14.9	85.1		.7	4.1	91.3	1.1	2.8		8,544	15,380			
10 miles west of; Poverty mine, Big Vein bed (750 feet south of mine mouth).	4092	A	1	3.5	11.1	67.8	17.6	.8					3.1				22	
			2		11.5	70.2	18.3	.9										
Same (765 feet south of mine mouth)	4093	A	1	3.0	10.9	64.2	21.9	.7					2.4	6,483	11,670		22	
			2		11.3	66.1	22.6	.7						6,683	12,030			
Christiansburg, 3½ miles northwest of; Lyken Hill mine, Large bed (350 feet along main slope, and 200 feet east on east entry).	19403	B	1	1.7	9.4	66.6	22.3	.7	3.2	69.2	.8	3.8	.9	6,428	11,570	3,010	123	
			2		9.5	67.8	22.7	.7	3.1	70.4	.8	2.3		6,539	11,770			
			3		12.3	87.7		.9	4.0	91.1	1.1	2.9		8,456	15,220			
Merrimac Mines; Merrimac mine, Big Vein bed (4 level, 2, 150 feet west of slope).	30692	B	1	3.6	9.5	67.5	19.4	.5					2.7	6,583	11,850	2,650	193	
			2		9.9	70.0	20.1	.5						6,828	12,290			
Same, prospect opening, Little bed (in drift, 20 feet from mine mouth, coal weathered).	30693	B	1	4.0	10.1	65.5	20.4	.5					3.1	6,411	11,540	3,010	193	
			2		10.5	68.2	21.3	.5						6,683	12,030			
PULASKI COUNTY																		
Dublin, 5½ miles north-northwest of; Cloyd mine, Upper bed (125 feet west of mine mouth).	20722	B	1	2.5	10.8	63.1	23.6	.4					1.9	6,250	11,250	3,010	123	
			2		11.0	64.8	24.2	.4						6,406	11,530			
Gunton Park; Summit mine, Upper bed (in room on west of slope, 250 feet from mine mouth).	30696	B	1	3.8	9.4	62.2	24.6	.8					3.1	6,089	10,960	3,010	193	
			2		9.7	64.7	25.6	.8						6,328	11,390			
Parrott; Parrott mine, Large bed (west entry, 100 feet west of shaft landing)	19431	B	1	2.4	11.6	63.3	22.7	.7	3.4	67.3	.8	5.1	1.4	6,283	11,310	3,010	123	
			2		11.9	64.8	23.3	.7	3.2	68.9	.8	3.1		6,439	11,590			
			3		15.5	84.5		.9	4.2	89.8	1.4	4.1		8,389	15,100			

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Big Vein bed (on level, 150 feet west of slope)	30694	B	1	1.6	13.3	61.5	23.6	.7	3.3	67.4	.8	4.2	1.0	6,333	11,400	2,350	193	
			2		13.5	62.5	24.0	.7	3.1	68.5	.8	2.9		6,439	11,590			
			3		17.8	82.2		.9	4.1	90.1	1.1	3.8		8,467	15,240			
Pulaski, 5 miles northeast of; Langhorne (wagon) mine, Little bed (face of main left entry).	30695	B	1	3.1	9.8	60.9	17.2	1.1					2.2	6,839	12,310		193	
			2		10.1	72.1	17.8	1.1						7,056	12,700			
8 miles north of; Virginia Anthracite Coal Corporation No. 1 mine, Little bed (face of 2 west entry, 500 feet from slope, and 300 feet on the dip from the mouth).	75888	B	1	4.4	10.2	71.4	14.0	.5					3.5	6,956	12,520	2,530		44
Same (face of 2 east entry, 600 feet from slope, and 250 feet on the dip from the mouth).	75889	B	1	4.8	9.7	71.0	14.5	.6					4.0	6,922	12,460	2,930		
Same (composite of samples 75888 and 75889)	75890	B	1	4.7	10.0	71.2	14.1	.6	3.8	74.3	.9	6.3	3.8	6,956	12,520			
			2		10.5	74.7	14.8	.6	3.4	77.9	1.0	2.3		7,294	13,130			
			3		12.3	87.7		.7	4.0	91.4	1.1	2.8		8,561	15,410			
RUSSELL COUNTY																		
Dante; Clinchfield No. 2 mine, Upper Banner bed (benchmark A-870, 10 right entry, 200 feet from main heading).	32168	B	1	2.7	34.8	56.2	6.3	.9					1.6	7,944	14,300	2,300	193	
Same (4 left entry, near 20 room, main entry)	32169	B	1	2.2	35.3	53.4	9.1	.7					1.1	7,583	13,650	2,200	193	
Same (face of 3 left aircourse, near 15 room, 7 right entry).	32170	B	1	2.5	34.0	56.2	7.3	.5					1.4	7,717	13,890	2,190	193	
Same (face of 39 room, 4 right cross entry)	32171	B	1	2.2	36.2	55.4	6.2	.5					1.1	7,839	14,110	2,180	193	
Same (composite of samples 32168 to 32171, inclusive).	32172	B	1	2.4	34.7	55.7	7.2	.6	5.3	78.3	1.5	7.1	1.3	7,739	13,930		193	
			2		35.6	57.1	7.3	.6	5.1	80.1	1.6	5.3		7,928	14,270			
			3		38.4	61.6		.6	5.5	86.5	1.7	5.7		8,556	15,400			
Same (face of butt heading, 4 left drift, McClure entry)	10734	A	1	2.3	35.2	56.2	6.3	.6					1.5	7,833	14,100		85	
Same (16 room, 3 right heading, 1 drift, McClure entry).	10735	A	1	3.0	35.2	56.6	5.2	.6					2.1	7,861	14,150	2,080	85	
Same (composite of samples 10734 and 10735)	10736	A	1	2.8	35.0	56.4	5.8	.6	5.3	80.1	1.4	6.8	1.8	7,861	14,150		85	
			2		36.0	58.1	5.9	.6	5.2	82.4	1.5	4.4		8,083	14,550			
			3		38.2	61.8		.7	5.5	87.6	1.6	4.6		8,589	15,460			
Same (2,400 feet south 18° east of entrance, 3 drift on McClure entry).	18128	B	1	1.8	35.3	55.8	7.1	.6					1.0	7,783	14,010	2,280	123	
Same (2,750 feet south 78° east of 5 drift entrance).	18129	B	1	2.4	36.3	55.1	6.2	.5					1.4	7,839	14,110	2,320	123	
Same (3,400 feet south 85° west of 1 drift entrance, on middle McClure entry).	18130	B	1	1.6	36.7	55.3	6.4	.6					.8	7,872	14,170	2,160	123	
Same (composite of samples 18128 to 18130, inclusive).	18131	B	1	1.8	36.2	55.5	6.5	.5	5.3	79.3	1.5	6.9	1.1	7,833	14,100		123	
			2		36.8	56.5	6.7	.6	5.1	80.8	1.5	5.3		7,978	14,360			
			3		39.5	60.5		.6	5.5	86.5	1.6	5.8		8,544	15,380			
Clinchfield No. 3 mine, Upper Banner bed (4,000 feet east of mine mouth).	32326	B	1	2.2	36.4	51.9	9.5	.6					1.1	7,511	13,520	2,200		44
Same	32327	B	1	2.0	37.4	53.9	6.7	.6					1.0	7,767	13,980	2,280		
Same (composite of samples 32326 and 32327)	32328	B	1	2.0	37.0	53.0	8.0	.6	5.2	77.2	1.4	7.6	1.0	7,633	13,740			
			2		37.8	54.0	8.2	.6	5.1	78.8	1.4	5.9		7,794	14,030			
			3		41.1	58.9		.6	5.5	85.8	1.6	6.5		8,489	15,280			
Same (4 right entry, 1,000 feet from mine mouth).	10387	B	1	2.3	35.7	55.0	7.0	.7	5.5	77.9	1.5	7.4	1.4	7,744	13,940	2,570	22	
			2		36.5	56.3	7.2	.7	5.4	79.7	1.6	5.4		7,922	14,260			
			3		39.3	60.7		.7	5.8	85.9	1.7	5.9		8,533	15,360			

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (°F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
RUSSELL COUNTY—continued																		
Dante; Lower Banner No. 2 mine, Lower Banner bed (face of 4 room, left entry).	4057	B	1	2.8	32.1	59.3	5.8	0.8					1.8				22	
			2		33.0	61.0	6.0	.9										
Kennedy No. 4 mine, Widow Kennedy bed (2 cross heading, 900 feet from mine mouth).	3947	B	1	1.9	31.5	60.9	5.7	1.5					.8	6,567	11,820		22	
			2		32.2	62.0	5.8	1.5						6,694	12,050			
Prospect opening, Kelly bed (face of opening)	32454	B	1	2.6	32.2	60.8	4.4	.9	5.2	80.2	1.2	8.1	.9	7,867	14,160	2,290		45
			2		33.1	62.4	4.5	.9	5.0	82.3	1.2	6.1		8,072	14,530			
			3		34.6	65.4		1.0	5.3	86.2	1.3	6.2		8,456	15,220			
½ mile east of; Clinchfield mine, Lower Banner bed (in main entry, 150 feet from mine mouth).	10385	B	1	2.1	33.8	58.6	6.5	.7	5.4	78.6	1.5	7.3	1.1	7,856	14,140	2,350	22	
			2		34.5	58.9	6.6	.7	5.3	80.3	1.6	5.5		8,022	14,440			
			3		36.9	63.1		.7	5.7	86.0	1.7	5.9		8,589	15,460			
1 mile east of; Clinchfield No. 52 mine, Lower Banner bed (325 feet northeast of No. 0 drift mouth).	18122	B	1	2.5	35.6	56.2	5.7	.7					1.6	7,933	14,280	2,290	123	
Same (1,700 feet southwest of No. 1 drift mouth).	18123	B	1	2.0	35.7	54.5	7.8	.7					1.1	7,683	13,830	2,160	123	
Same (composite of samples 18122 and 18123)	18124	B	1	2.3	35.5	55.5	6.7	.7	5.3	78.8	1.7	6.8	1.4	7,778	14,000		123	
			2		36.3	56.8	6.9	.7	5.1	80.7	1.7	4.9		7,961	14,330			
			3		39.0	61.0		.7	5.5	86.6	1.9	5.3		8,550	15,390			
Same (1 mile north of mine mouth)	32329	B	1	1.5	36.2	56.2	6.1	.7					.6	7,917	14,250	2,140		
Same	32330	B	1	1.4	36.6	55.7	6.3	.7					.6	7,883	14,190	2,110		
Same (composite of samples 32329 and 32330)	32331	B	1	1.4	36.2	56.2	6.2	.7	5.3	79.6	1.7	6.5	.6	7,900	14,220			
			2		36.7	57.0	6.3	.7	5.2	80.7	1.7	5.4		8,011	14,420			
			3		39.2	60.8		.7	5.6	86.1	1.8	5.8		8,550	15,390			
½ mile west of; Laurel Branch mine, Kennedy bed (150 feet northeast of mine mouth).	32453	B	1	2.1	28.1	47.9	21.9	2.0	4.4	64.0	1.3	6.4	1.0	6,311	11,360	2,400		45
			2		28.7	48.9	22.4	2.0	4.3	65.4	1.3	4.6		6,444	11,600			
			3		37.0	63.0		2.6	5.5	84.1	1.7	6.1		8,289	14,940			
Same (50 feet southwest of mine mouth)	32452	B	1	3.1	26.7	43.2	27.0	1.9	4.2	58.4	1.1	7.4	1.7	5,733	10,320	2,400		
			2		27.6	44.5	27.9	2.0	4.0	60.3	1.1	4.7		5,950	10,710			
			3		38.2	61.8		2.8	5.6	83.6	1.5	6.5		8,250	14,850			
1 mile northwest of; Clinchfield No. 103 mine, Kennedy bed (260 feet north 55° west of mine mouth).	18121	B	1	2.9	31.8	57.9	7.4	1.8					1.9	7,656	13,780	2,220	123	
			2		32.8	59.6	7.6	1.8						7,883	14,190			

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1 mile south of; Upper Banner No. 3 mine, Upper Banner bed (face of 6 butt entry, main tunnel).	3042	B	1	2.4	32.4	57.9	7.3	.7					1.3				22	
			2		33.2	59.3	7.5	.7										
2 miles north of; Clinchfield No. 5 mine, Upper Banner bed (face of 14 room, 5 right heading, 9 drift entry).	10737	A	1	2.3	35.2	57.8	4.7	.6					1.4	8,017	14,430		85	
Same (butt of 9 left heading, 9 drift entry)	10738	A	1	2.1	35.1	57.1	5.7	.6					1.2	7,933	14,280		85	
Same (composite of samples 10737 and 10738)	10739	A	1	2.1	35.9	56.7	5.3	.6	5.5	80.2	1.4	7.0	1.3	7,967	14,340		85	
			2		36.7	57.9	5.4	.6	5.3	81.9	1.5	5.3		8,133	14,640			
			3		38.8	61.2		.6	5.6	86.6	1.5	5.7		8,600	15,480			
Della, ½ mile south of; Jackson mine (600 feet northwest of mine mouth).	22346	B	1	2.4	34.2	50.8	12.6	.9					1.1	7,139	12,850	2,070	123	
			2		35.1	51.9	13.0	1.0						7,317	13,170			
3 miles north of; Flat Rock mine, Kennedy bed (face of 1 left entry, 750 feet north 30° east of mine mouth).	25367	B	1	2.1	35.8	52.8	9.3	.8					.8	7,461	13,440	2,090	123	
Same (face of 2 right entry, 900 feet south 75° east of mine mouth).	25368	B	1	1.9	35.5	53.1	9.5	.8					.4	7,472	13,450	2,160	123	
Same (composite of samples 25367 and 25368)	25369	B	1	2.0	36.1	52.6	9.3	.8	5.2	75.4	1.2	8.1	.6	7,472	13,450		123	
			2		36.8	53.7	9.5	.9	5.1	76.9	1.2	6.4		7,622	13,720			
			3		40.7	59.3		.9	5.6	85.0	1.2	7.3		8,428	15,170			
Drill; Drill mine, Kennedy bed (150 yards northeast of opening).	19484	B	1	2.1	32.4	58.7	6.8	1.0					.8			2,230	123	
			2		33.1	60.0	6.9	1.0										
1 mile south of; Sandy Ridge mine, Kennedy bed (face of room, 20 feet to right of entry, 150 feet north of mine mouth).	19528	B	1	3.2	33.1	57.7	6.0	1.0					1.8			2,220	123	
			2		34.2	59.6	6.2	1.0										
Same (170 feet south 70° west of entrance to north drift).	22345	B	1	4.7	30.8	59.4	5.1	1.0	5.4	78.3	1.4	8.8	3.5	7,756	13,960	2,070	123	
			2		32.3	62.3	5.4	1.0	5.2	82.2	1.5	4.7		8,139	14,650			
			3		34.1	65.9		1.1	5.4	86.9	1.6	5.0		8,600	15,480			
Slemp, 1 mile northeast of; Clinchfield No. 201 mine, No. 4 bed (5,200 feet north 33° west of shaft).	18239	B	1	1.8	31.4	60.3	6.5	.5					1.0	7,879	14,180	2,160	123	
Same (1,600 feet north 68° west of shaft)	18240	B	1	2.5	31.9	59.5	6.1	.4					1.8	7,817	14,070	2,190	123	
Same (2,900 feet north 27° west of shaft)	18241	B	1	2.5	32.5	58.3	6.7	.5					1.9	7,789	14,020	2,200	123	
Same (composite of samples 18239 to 18241, inclusive).	18242	B	1	2.2	32.0	59.3	6.5	.5	5.1	79.7	1.0	7.2	1.6	7,839	14,110		123	
			2		32.7	60.6	6.7	.5	5.0	81.5	1.1	5.2		8,017	14,430			
			3		35.0	65.0		.5	5.3	87.3	1.1	5.8		8,589	15,460			
St. Paul; Russell Fork mine (150 feet west of drift mouth).	32513	B	1	3.6	32.1	60.5	3.8	.5	5.3	81.0	1.4	8.0	2.6	7,906	14,230	2,130		45
			2		33.3	62.7	4.0	.5	5.1	84.1	1.4	4.9		8,206	14,770			
			3		34.6	65.4		.5	5.3	87.5	1.5	5.2		8,544	15,380			
Wilder; Clinchfield No. 6 mine, Upper Banner bed (3,000 feet south 71° west of No. 1 opening).	18235	B	1	3.4	35.7	54.9	6.0	.6					2.4	7,761	13,970	2,290	123	
Same (face of 5 room, 1,250 feet south 35° west of No. 3 opening).	18236	B	1	3.2	35.4	55.1	6.3	.6					2.4	7,761	13,970	2,360	123	
Same (4,000 feet south 10° west of No. 3 opening).	18237	B	1	3.3	35.1	56.9	4.7	.5					2.4	7,928	14,270	2,270	123	
Same (composite of samples 18235 to 18237, inclusive).	18238	B	1	3.3	35.1	55.9	5.7	.6	5.4	78.7	1.4	8.2	2.4	7,822	14,080		123	
			2		36.3	57.8	5.9	.6	5.2	81.4	1.4	5.5		8,094	14,570			
			3		38.5	61.5		.6	5.5	86.6	1.5	5.8		8,600	15,480			
Clinchfield No. 55 mine, Lower Banner bed (3 main entry, 900 feet south 60° west of No. 3 drift mouth).	18243	B	1	3.1	33.7	57.3	5.9	.8					2.4	7,861	14,150	2,200	123	
Same (2,500 feet south 35° east of No. 5 main drift mouth).	18244	B	1	2.4	34.6	57.3	5.7	.8					1.6	7,944	14,300	2,300	123	

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (°F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
RUSSELL COUNTY—continued																		
Wilder; Clinchfield No. 55 mine, Lower Banner bed, (1,300 feet north 35° west of No. 2 drift mouth).	18245	B	1	2.7	33.7	57.9	5.7	0.8	.....	.....	.....	.....	2.0	7,922	14,260	2,450	123	.....
Same (composite of samples 18243 to 18245, inclusive).	18246	B	1	2.7	33.8	57.7	5.8	.8	5.3	79.3	1.3	7.5	2.0	7,917	14,250	.....	123	.....
			2	.....	34.8	59.3	5.9	.9	5.1	81.6	1.3	5.2	.....	8,139	14,650	.....	.....	.....
			3	.....	37.0	63.0	.....	.9	5.4	86.7	1.4	5.6	.....	8,650	15,570	.....	.....	.....
SCOTT COUNTY																		
Adamar, 1 mile north of; Hagan mine, Burton's Ford bed (about 50 feet from entrance).	10359	B	1	2.4	33.8	34.9	28.9	1.0	4.9	57.1	1.1	7.0	1.6	5,820	10,490	2,530	22	.....
			2	.....	34.6	35.8	29.6	1.0	4.7	58.6	1.1	5.0	.....	5,972	10,750	.....	.....	.....
			3	.....	49.2	50.8	.....	1.4	6.7	83.2	1.6	7.1	.....	8,489	15,280	.....	.....	.....
Dungannon, 3 miles northeast of; J. S. T. Corporation mine, Burton's Ford bed (face of 13 room, 110 feet from main entry, 1,000 feet east of drift).	75743	B	1	2.6	31.4	58.8	7.2	.9	.....	.....	.....	.....	.9	7,561	13,610	2,780	.....	46
Same (at main heading, 17 room, 1,800 feet east of drift).	75744	B	1	2.9	30.8	59.7	6.6	.9	.....	.....	.....	.....	1.4	7,605	13,690	2,740	.....	.....
Same (composite of samples 75743 and 75744)	75745	B	1	2.9	30.8	59.4	6.9	1.0	5.0	77.3	1.2	8.6	1.1	7,606	13,690	.....	.....	.....
			2	.....	31.7	61.2	7.1	1.0	4.9	79.6	1.3	6.1	.....	7,828	14,090	.....	.....	.....
			3	.....	34.1	65.9	.....	1.1	5.2	85.7	1.4	6.6	.....	8,428	15,170	.....	.....	.....
Ka, 1½ miles north of; Hagan prospect, Duncan bed (main entry, 125 feet from mouth).	10361	B	1	3.1	33.3	57.2	6.4	.9	5.4	76.2	1.5	9.6	1.6	7,578	13,640	2,160	22	.....
			2	.....	34.4	58.9	6.7	.9	5.2	78.7	1.5	7.0	.....	7,828	14,090	.....	.....	.....
			3	.....	36.8	63.2	.....	.9	5.6	84.3	1.6	7.6	.....	8,383	15,090	.....	.....	.....
5 miles north of; Milner prospect, Milner bed (500 feet from opening).	10358	B	1	3.2	33.0	58.1	5.7	1.6	5.3	76.9	1.6	8.9	1.5	7,639	13,750	2,120	22	.....
			2	.....	34.1	60.0	5.9	1.7	5.1	79.4	1.7	6.2	.....	7,889	14,200	.....	.....	.....
			3	.....	36.3	63.7	.....	1.8	5.4	84.4	1.8	6.6	.....	8,383	15,090	.....	.....	.....
TAZEWELL COUNTY																		
Bandy, 1 mile west of; Christian mine, Middle Seaboard bed (face of main entry).	25913	B	1	3.5	29.2	63.3	4.0	1.0	.....	.....	.....	.....	2.5	8,217	14,790	2,360	193	.....
			2	.....	30.3	65.5	4.2	1.0	.....	.....	.....	.....	.....	8,311	14,960	.....	.....	.....
1¼ miles west of; Patrick mine, Lower Seaboard (face of mine entry).	25912	B	1	3.4	28.1	64.9	3.6	1.1	.....	.....	.....	.....	2.2	8,089	14,560	2,260	193	.....
			2	.....	29.1	67.2	3.7	1.1	.....	.....	.....	.....	.....	8,372	15,070	.....	.....	.....
Boissevain, Boissevain mine, Pocahontas No. 3 bed (main entry, 3,000 feet from shaft).	8633	A	1	4.2	17.5	74.5	3.8	.6	.....	.....	.....	.....	3.8	.....	.....	.....	22	.....
Same (1 east entry, 2,000 feet from shaft)	8634	A	1	4.3	17.0	72.7	6.0	.8	.....	.....	.....	.....	3.7	.....	.....	.....	22	.....

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Same (8 room, 3 west entry, 1,500 feet from shaft).	8738	A	1	4.2	16.5	75.3	4.0	.7					3.5				22	
Same (3 east entry, 1,600 feet from shaft)	8736	A	1	3.6	17.5	74.9	4.0	.7					2.9				22	
Same (1 west entry, 1,200 feet from shaft)	8732	A	1	4.4	17.0	75.1	3.5	.6					3.7				22	
Same (composite of samples 8633, 8634, 8738, 8736 and 8732).	8845	A	1	4.0	17.5	74.2	4.3	.6	4.8	82.6	1.0	6.7	3.5	8,065	14,520		22	
			2		18.0	77.5	4.5	.7	4.5	86.0	1.0	3.3		8,405	15,130			
			3		19.0	81.0		.7	4.7	90.1	1.1	3.4		8,800	15,840			
Same (50 feet from face of 14 triple entry 1)	W67922	A	1	3.3	20.4	72.2	4.1	.6					.7	8,133	14,640	2,560	193	
Same	W67960	A	1	3.0	20.5	72.6	3.9	.6					1.9	8,161	14,690	2,530	193	
Same (face of 12 room, C–2 panel, 5 east entry)	W67901	A	1	2.6	21.3	72.1	4.0	.4					1.1	8,167	14,700	2,130	193	
Same	W67888	A	1	2.4	21.0	72.5	4.1	.5					1.4	8,239	14,830	2,200	193	
Same (face of 9 room, A–1 panel, 5 east entry)	W67903	A	1	2.7	21.5	71.8	4.0	.6					1.4	8,189	14,740	2,250	193	
Same	W67887	A	1	2.7	20.7	72.7	3.9	.5					.8	8,194	14,750	2,210	193	
Same (face of main H–22 entry)	W67892	A	1	2.4	21.8	71.9	3.9	.4					1.1	8,250	14,850	2,160	193	
Same	W67900	A	1	2.5	21.1	72.5	3.9	.5					.8	8,222	14,800	2,100	193	
Same (face of 10 room, H–23 entry, C–4 entry)	W67899	A	1	1.9	20.7	72.4	5.0	.4					.7	8,161	14,690	2,030	193	
Same	W67904	A	1	2.0	21.1	71.7	5.2	.5					.8	8,161	14,690	2,030	193	
Same (15 feet from face of 1 room, I-17 entry)	W67923	A	1	3.0	20.6	73.1	3.3	.5					1.2	8,200	14,760	2,560	193	
Same	W67925	A	1	3.2	21.0	72.3	3.5	.5					1.2	8,211	14,780	2,530	193	
Same (left rib, 30 feet from face of J-3 aircourse)	W67971	A	1	2.3	21.3	73.2	3.2	.3					.6	8,278	14,900	2,290	193	
Same	W67957	A	1	2.9	21.6	72.2	3.3	.4					1.4	8,233	14,820	2,190	193	
Same (composite of samples W67922, W67960, W67901, W67888, W67903, W67887, W67892, W67900, W67899, W67904, W67923, W67925, W67971, and W67957).	29907	A	1	2.6	21.6	71.7	4.1	.5	4.7	84.4	1.1	5.2	1.1	8,156	14,680		193	
			2		22.2	73.6	4.2	.5	4.8	86.7	1.2	2.6		8,372	15,070			
			3		23.2	76.8		.5	4.8	90.5	1.2	3.0		8,744	15,740			
Faraday, ½ mile north of; Altizer mine, Pocahontas No. 5 bed (110 feet north of mine mouth).	26101	B	1	4.5	18.5	72.0	5.0	.8					3.9	7,928	14,270	2,090	193	
			2		19.3	75.5	5.2	.8						8,306	14,950			
Jewell; Jewell Ridge No. 1 mine, Raven bed (face of 2 right entry, main entry).	25651	B	1	3.7	25.9	64.9	5.5	.7					3.1	7,961	14,330	2,500	193	
Same (face of 6 main entry)	25652	B	1	3.1	25.9	65.0	6.0	.8					2.5	7,989	14,380	2,640	193	
Same (composite of samples 25651 and 25652)	25653	B	1	3.4	25.3	65.6	5.7	.7	5.2	81.0	1.3	6.1	2.8	7,978	14,360		193	
			2		26.2	67.9	5.9	.8	5.0	83.8	1.3	3.2		8,256	14,860			
			3		27.8	72.2		.8	5.3	89.1	1.4	3.4		8,772	15,790			
Pocahontas, East Pocahontas mine, Pocahontas No. 3 bed (pillar, main entry, 2,500 feet from mine mouth).	8635	A	1	3.5	15.5	76.8	4.2	.7	4.8	83.4	1.1	5.8	3.0	8,125	14,630		22	
			2		16.5	79.1	4.4	.8	4.5	86.4	1.1	2.8		8,420	15,160			
			3		17.0	83.0		.8	4.8	90.3	1.2	2.9		8,805	15,850			
¼ mile west of; West Pocahontas mine, Pocahontas No. 3 bed (8 right entry, Norton aircourse, 2½ miles southwest of mine mouth).	8636	A	1	3.6	15.5	77.6	3.3	.6					3.0				22	
Same (6 right aircourse, Newport News entry, 2 miles from mine mouth).	8613	A	1	3.7	17.0	76.2	3.1	.6					3.2				22	
Same (3 entry, Newport News entry, 2 miles from mine mouth).	8614	A	1	4.9	16.0	76.1	3.0	.6					4.3				22	
Same (composite of samples 8636, 8613, and 8614).	8745	A	1	4.1	16.5	75.1	3.2	.6	5.0	84.3	1.2	5.7	3.5	8,190	14,740		22	
			2		17.0	79.7	3.3	.7	4.7	87.9	1.3	2.1		8,545	15,380			
			3		17.5	82.5		.7	4.9	90.9	1.3	2.2		8,835	15,910			
Same (pillar, Jed entry, 11,000 feet from mine mouth).	8638	A	1	3.4	15.0	78.8	2.8	.7					2.9				22	
Same (pillar, 2 left, St. Paul entry, 900 feet from mine mouth).	8639	A	1	3.4	15.5	77.3	3.8	.7					2.9				22	
Same (composite of samples 8638 and 8639)	8749	A	1	3.5	15.0	78.1	3.4	.7	4.8	84.4	1.2	5.5	2.9	8,205	14,770		22	
			2		15.5	80.9	3.6	.7	4.5	87.5	1.2	2.5		8,505	15,310			
			3		16.0	84.0		.7	4.7	90.7	1.3	2.6		8,820	15,880			

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TAZEWELL COUNTY—continued																		
Pocahontas, ¼ mile west of; West Pocahontas mine, Pocahontas No. 3 bed, (pillar, 14 room, Kingston entry, 10,700 feet from mine mouth).	8637	A	1	3.9	15.5	76.5	4.1	0.6	.....	.....	.....	.....	2.8	8,135	14,640	.....	22	.....
			2	.....	16.0	79.8	4.2	.6	.....	.....	.....	.....	.....	8,465	15,240	.....	.....	.....
Same (pillar in haulageway, Salem entry)	8615	A	1	5.3	16.0	74.7	4.0	.6	.....	.....	.....	.....	4.7	7,960	14,330	.....	22	.....
			2	.....	16.5	79.3	4.2	.6	.....	.....	.....	.....	.....	8,400	15,120	.....	.....	.....
Same (face of 30 room, 10 entry, St. Paul entry)	W67910	A	1	3.6	19.6	71.8	5.0	.4	.....	.....	.....	.....	2.0	7,978	14,360	2,390	193	.....
Same	W67954	A	1	3.5	19.1	72.5	4.9	.4	.....	.....	.....	.....	2.2	8,017	14,430	2,500	193	.....
Same (face of 18 room, 34 heading, Newport News District).	W67953	A	1	2.0	21.1	72.9	4.0	.4	.....	.....	.....	.....	.9	8,250	14,850	2,210	193	.....
Same (face of 7 room, 11 right entry, Norton District).	W67958	A	1	2.9	21.4	72.1	3.6	.5	.....	.....	.....	.....	1.4	8,233	14,820	2,190	193	.....
Same (composite of samples W67910, W67954, W67953 and W67958).	29912	A	1	3.0	20.3	72.2	4.5	.5	4.7	84.0	1.2	5.1	1.6	8,117	14,610	.....	193	.....
			2	.....	20.9	74.4	4.7	.5	4.5	86.6	1.2	2.5	.....	8,367	15,060	.....	.....	.....
			3	.....	21.9	78.1	.....	.5	4.7	90.8	1.3	2.7	.....	8,772	15,790	.....	.....	.....
½ mile west of; Baby Pocahontas mine, Pocahontas No. 3 bed (6,700 feet southwest of mine mouth).	5269	B	1	4.5	17.5	74.4	3.6	.8	.....	.....	.....	.....	3.5	8,144	14,660	.....	22	.....
			2	.....	18.4	77.9	3.7	.8	.....	.....	.....	.....	.....	8,528	15,350	.....	.....	.....
Same (6,000 feet southwest of drift mouth)	5268	B	1	2.9	17.6	77.4	3.1	.6	.....	.....	.....	.....	2.0	8,300	14,940	.....	22	.....
			2	.....	18.1	78.7	3.2	.6	.....	.....	.....	.....	.....	8,550	15,390	.....	.....	.....
Same (1 cross entry, diagonal entry on breakthrough on airway to entry opposite 27 room, 7,100 feet west of drift mouth).	7173	A	1	3.7	17.3	76.2	2.8	.4	5.0	84.7	1.2	5.9	3.2	8,261	14,870	.....	22	.....
			2	.....	17.9	79.2	2.9	.5	4.7	87.9	1.3	2.7	.....	8,578	15,440	.....	.....	.....
			3	.....	18.5	81.5	.....	.5	4.9	90.5	1.3	2.8	.....	8,833	15,900	.....	.....	.....
Same (7,300 feet west of drift, 2,700 feet south, diagonal entry).	7172	A	1	5.9	17.3	72.6	4.2	.8	5.0	80.6	1.1	8.3	5.4	7,922	14,260	.....	22	.....
			2	.....	18.3	77.2	4.5	.8	4.6	85.7	1.2	3.2	.....	8,417	15,150	.....	.....	.....
			3	.....	19.2	80.2	.....	.9	4.8	89.7	1.3	3.3	.....	8,811	15,860	.....	.....	.....
Same (pillar, 8 cross entry, 5,600 feet from mine mouth).	8640	A	1	5.6	15.5	74.5	4.4	.7	.....	.....	.....	.....	4.8	7,965	14,340	.....	22	.....
			2	.....	16.0	79.3	4.7	.7	.....	.....	.....	.....	.....	8,435	15,190	.....	.....	.....
Same (1 cross heading, 8,400 feet from mine mouth).	8642	A	1	4.2	15.5	78.0	2.3	.6	.....	.....	.....	.....	3.4	.....	.....	.....	22	.....
Same (main diagonal aircourse, 8,400 feet from mine mouth).	8641	A	1	3.7	16.5	76.5	3.3	.8	.....	.....	.....	.....	2.9	.....	.....	.....	22	.....
Same (composite of samples 8641 and 8642)	8750	A	1	3.8	15.5	77.8	2.9	.6	4.9	84.7	1.2	5.7	3.2	8,255	14,860	.....	22	.....
			2	.....	16.0	81.0	3.0	.7	4.7	88.0	1.2	2.4	.....	8,575	15,440	.....	.....	.....
			3	.....	16.5	83.5	.....	.7	4.8	90.8	1.3	2.4	.....	8,845	15,920	.....	.....	.....

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Same (face of 19 room, 16 cross entry)	W67921	A	1	2.4	21.4	71.3	4.9	.5					1.0	8,133	14,640	2,530	193	
Same (75 feet from face of 7 room, 4 sump entry).	W67924	A	1	2.9	21.0	71.4	4.7	.6					1.0	8,111	14,600	2,490	193	
Same (face of 36 room, West Gurden entry)	W67926	A	1	2.7	19.6	74.6	3.1	.4					.7	8,261	14,870	2,580	193	
Same (composite of samples W67921, W67924, and W67926).	29906	A	1	2.7	21.1	71.8	4.4	.6	4.8	83.8	1.2	5.2	.9	8,139	14,650		193	
			2		21.7	73.8	4.5	.6	4.6	86.2	1.2	2.9		8,367	15,060			
			3		22.7	77.3		.6	4.8	90.3	1.3	3.0		8,739	15,770			
1 mile south of, at Big Vein; Big Vein No. 1 mine, Pocahontas No. 3 bed (face of 1 room, Balls Hole entry).	W67886	A	1	3.2	20.5	73.0	3.3	.6					1.8	8,217	14,790	2,380	193	
Same	W67902	A	1	3.3	19.9	72.4	4.4	.6					1.6	8,089	14,560	2,640	193	
Same (face of 4 room, Cartersville entry)	W67889	A	1	3.2	20.1	72.4	4.3	.6					2.0	8,128	14,630	2,620	193	
Same	W67934	A	1	3.0	20.4	73.5	3.1	.6					1.4	8,244	14,840	2,460	193	
Same (at split in pillar, dip heading, 60 feet from face).	W67951	A	1	3.0	20.3	72.4	4.3	.6					2.1	8,100	14,580	2,500	193	
Same (composite of samples W67886, W67902, W67889, W67934, and W67951).	29908	A	1	3.1	20.5	72.4	4.0	.6	4.7	83.8	1.2	5.7	1.8	8,128	14,630		193	
			2		21.2	74.7	4.1	.7	4.5	86.5	1.2	3.0		8,389	15,100			
			3		22.1	77.9		.7	4.7	90.2	1.3	3.1		8,750	15,750			
Big Vein No. 2 mine, Pocahontas No. 3 bed (75 feet from face of 1 room, 5 right entry).	W67964	A	1	2.4	21.3	71.9	4.4	.6					.7	8,167	14,700	2,500	193	
Same (face of 2 right main entry)	W67927	A	1	3.3	21.2	71.3	4.2	.6					1.4	8,144	14,660	2,410	193	
Same (composite of samples W67964 and W67927).	29909	A	1	2.9	21.3	71.3	4.5	.6	4.8	83.5	1.1	5.5	1.1	8,122	14,620		193	
			2		21.9	73.5	4.6	.6	4.6	86.0	1.2	3.0		8,361	15,050			
			3		22.9	77.1		.6	4.8	90.1	1.2	3.3		8,761	15,770			
Red Ash, Raven Red Ash mine, Raven bed (face of aircourse, 10 cross heading).	25630	B	1	3.1	32.1	58.3	6.5	.6					2.0	7,839	14,110	2,230	193	
Same (face of aircourse, 3 main entry)	25631	B	1	2.9	31.8	60.2	5.1	.7					1.9	8,000	14,400	2,240	193	
Same (composite of samples 25630 and 25631)	25632	B	1	2.9	32.1	59.3	5.7	.6	5.6	80.2	1.3	6.6	2.0	7,906	14,230		193	
			2		33.0	61.1	5.9	.7	5.4	82.5	1.3	4.2		8,139	14,650			
			3		35.1	64.9		.7	5.8	87.7	1.4	4.4		8,650	15,570			
Richlands, 1½ miles west of; East mine, Tiller bed (face of 1 room, main entry).	25763	B	1	3.0	30.5	59.0	7.5	.6					2.1	7,672	13,810	2,390	193	
Same (face of main entry)	25764	B	1	2.4	31.3	57.4	8.9	.5					1.5	7,500	13,500	2,500	193	
Same (composite of samples 25763 and 25764)	25765	B	1	2.7	30.9	58.1	8.3	.6	5.0	77.4	1.4	7.3	1.8	7,578	13,640		193	
			2		31.8	59.7	8.5	.6	4.8	79.5	1.4	5.2		7,789	14,020			
			3		34.7	65.3		.7	5.3	86.9	1.5	5.6		8,511	15,320			
West mine, Jawbone bed (face of 9 entry, 4 right entry).	25757	B	1	1.9	31.1	53.9	13.1	.5					1.2	7,211	12,980	2,190	193	
Same (face of 1 left entry)	25758	B	1	2.2	30.7	57.0	10.1	.5					1.3	7,528	13,550	2,290	193	
Same (composite of samples 25757 and 25758)	25759	B	1	2.1	31.1	55.2	11.6	.5	4.9	75.2	1.4	6.4	1.2	7,367	13,260		193	
			2		31.8	56.4	11.8	.5	4.8	76.8	1.4	4.7		7,522	13,540			
			3		36.0	64.0		.6	5.4	87.0	1.6	5.4		8,528	15,350			
2 miles northwest of; Wilson mine, Red Ash bed (face of drift, 100 feet inby mine mouth).	W69806	A	1	1.8	31.3	57.1	9.8	.4						7,628	13,730		193	
			2		31.9	58.1	10.0	.5						7,767	13,980			
Same (face of drift, 100 feet inby mine mouth)	W69807	A	1	1.7	31.1	57.5	9.7	.4						7,595	13,670		193	
			2		31.6	58.5	9.9	.5						7,728	13,910			
Town Hill bed (face of drift, 500 feet from mouth of slope).	W69808	A	1	3.3	31.3	62.5	2.9	.4						8,139	14,650		193	
			2		32.4	64.6	3.0	.4						8,411	15,140			
Same	W69809	A	1	3.2	31.0	63.0	2.8	.4						8,133	14,640		193	
			2		32.0	65.1	2.9	.4						8,400	15,120			
1½ miles northeast of; Wysor mine (face of heading).	W69802 W69803	A	1	3.9	26.6	66.3	3.2	.9						8,017	14,430		193	
			2		27.7	68.9	3.4	.9						8,239	15,010			

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TAZEWELL COUNTY—continued																		
Richlands (face of heading)	W69804	A	1	3.1	28.6	62.6	5.7	0.7	------	------	------	------	------	7,861	14,150	------	193	------
	W69805		2	------	29.5	64.6	5.9	.8	------	------	------	------	------	8,111	14,600	------	------	------
½ mile northwest of; Richlands No. 2 mine, Meadow bed (150 feet from face, 560 feet from mine mouth).	31414	A	1	2.3	27.3	51.9	18.5	.6	------	------	------	------	1.4	6,744	12,140	2,660	193	------
Same (face of entry, 600 feet from mine mouth)	31415	A	1	2.3	31.3	59.6	6.8	.6	------	------	------	------	1.4	7,861	14,150	2,300	193	------
Same (composite of samples 31414 and 31415)	31416	A	1	2.2	29.4	55.7	12.7	.6	4.7	74.2	1.1	6.7	1.4	7,300	13,140	------	193	------
			2	------	30.0	57.0	13.0	.6	4.6	75.9	1.1	4.8	------	7,461	13,430	------	------	------
			3	------	34.5	65.5	------	.7	5.3	87.3	1.3	5.4	------	8,578	15,440	------	------	------
Richlands No. 4 mine, Meadow bed (from coal pile outside of mine).	31417	A	1	3.0	28.0	56.2	12.8	.7	------	------	------	------	2.3	7,200	12,960	2,600	193	------
Same (27 feet from face of main entry)	31418	A	1	3.5	28.0	59.0	9.5	.6	------	------	------	------	2.9	7,478	13,460	2,640	193	------
Same (composite of samples 31417 and 31418)	31419	A	1	3.3	27.8	57.8	11.1	.6	4.8	75.3	1.1	7.1	2.6	7,339	13,210	------	193	------
			2	------	28.8	59.7	11.5	.7	4.6	77.9	1.1	4.2	------	7,589	13,660	------	------	------
			3	------	32.5	67.5	------	.7	5.2	87.9	1.3	4.9	------	8,572	15,430	------	------	------
5 miles northwest of; Richlands mine, No. 4 bed (2,000 feet southeast of mine mouth).	4304	A	1	3.0	25.8	66.5	4.6	1.7	------	------	------	------	2.4	------	------	------	22	------
			2	------	26.6	68.6	4.8	1.8	------	------	------	------	------	------	------	------	------	------
Same (1,000 feet east of mine mouth)	4305	A	1	2.6	24.5	68.4	4.5	1.4	------	------	------	------	1.9	8,133	14,640	------	22	------
			2	------	25.1	70.3	4.6	1.4	------	------	------	------	------	8,350	15,030	------	------	------
Seaboard; Empire No. 6½ mine, Upper Seaboard bed (face of 3 right entry).	25760	B	1	3.0	28.7	62.7	5.6	.7	------	------	------	------	2.0	7,961	14,330	2,310	193	------
Same (face of 2 left entry)	25761	B	1	3.2	29.4	60.7	6.7	.5	------	------	------	------	2.1	7,828	14,090	2,320	193	------
Same (composite of samples 25760 and 25761)	25762	B	1	3.1	29.0	61.8	6.1	.6	5.0	80.0	1.4	6.9	2.0	7,894	14,210	------	193	------
			2	------	29.9	63.8	6.3	.6	4.8	82.6	1.4	4.3	------	8,150	14,670	------	------	------
			3	------	32.0	68.0	------	.6	5.1	88.2	1.5	4.6	------	8,700	15,660	------	------	------
WISE COUNTY																		
Arno; Stonega No. 2 mine, Imboden bed (7 room, 5 face entry, 1 butt right entry, 2,500 feet north of drift).	75964	B	1	2.1	33.0	57.8	7.1	.6	------	------	------	------	.7	7,500	13,500	2,700	------	46
Same (14 room, 5 face entry, butt right entry, 3,000 feet northeast of drift).	75965	B	1	1.9	35.6	61.3	1.2	.7	------	------	------	------	.9	7,989	14,380	2,680	------	------

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Same (cut in pillar between 30 and 31 rooms, 2 left face entry, 2 right butt entry, 3,000 feet north of drift).	75966	B	1	1.9	34.2	59.9	4.0	.6					.5	7,717	13,890	2,620		
Same (composite of samples 75964 to 75966, inclusive).	75967	B	1	2.0	34.0	57.5	6.5	.7	5.2	78.2	1.5	7.9	.7	7,728	13,910			
			2		34.7	58.7	6.6	.7	5.1	79.8	1.5	6.3		7,883	14,190			
			3		37.2	62.8		.7	5.4	85.4	1.6	6.9		8,444	15,200			
Banner; Lower Banner No. 1 mine, Lower Banner bed (700 feet west of drift mouth).	32509	B	1	2.3	32.9	56.6	8.2	.7					1.2	7,639	13,750	2,410		47
Same (600 feet west of drift mouth)	32510	B	1	1.8	33.8	57.5	6.9	.8					.7	7,789	14,020	2,420		
Same (composite of samples 32509 and 32510)	32511	B	1	2.2	33.3	57.0	7.5	.7	5.1	78.1	1.6	7.0	.9	7,711	13,880			
			2		34.1	58.3	7.6	.7	5.0	79.8	1.6	5.3		7,878	14,180			
			3		36.9	63.1		.8	5.4	86.4	1.7	5.7		8,528	15,350			
Upper Banner bed (4,300 feet west of mine mouth).	32512	B	1	2.3	36.1	57.0	4.6	.9	5.4	79.7	1.5	7.9	1.1	7,922	14,260	2,270		
			2		37.0	58.3	4.7	.9	5.2	81.5	1.5	6.2		8,111	14,600			
			3		38.8	61.2		1.0	5.5	85.5	1.6	6.4		8,506	15,310			
Dooley, ¾ mile southwest of; outcrop exposure, unnamed bed (face of outcrop).	75968	B	1	19.1	23.0	22.6	35.3	.5					6.5	3,521	6,340	2,910		47
			2		28.4	28.0	43.6	.6						4,349	7,830			
Dorchester, Haskell No. 3 mine, Dorchester bed (face of C heading, 1 main entry).	75440	B	1	2.0	34.4	58.2	5.4	1.5					.7	7,900	14,220	2,240		48
Same (face of C heading, 2 main entry)	75441	B	1	3.1	34.4	58.0	4.5	1.3					1.7	7,878	14,180	2,200		
Same (composite of samples 75440 and 75441)	75442	B	1	2.6	34.3	58.2	4.9	1.4	5.5	78.8	1.6	7.8	1.2	7,850	14,130			
			2		35.2	59.8	5.0	1.5	5.3	80.9	1.6	5.7		8,061	14,510			
			3		37.0	63.0		1.5	5.6	85.1	1.7	6.1		8,489	15,280			
Dunbar; Roda mine, Taggart marker (200 feet west of mine mouth).	32962	B	1	2.0	36.4	58.9	2.7	.8	5.4	81.7	1.5	7.9	1.0	8,128	14,630	2,330		48
			2		37.2	60.0	2.8	.8	5.3	83.4	1.5	6.2		8,294	14,930			
			3		38.2	61.8		.8	5.4	85.8	1.6	6.4		8,533	15,360			
Dunbar mine, Taggart bed (200 feet west of mine mouth).	32963	B	1	2.7	35.1	59.2	3.0	.6	5.3	81.4	1.3	8.4	1.4	8,033	14,460	2,370		49
			2		36.0	60.9	3.1	.6	5.2	83.6	1.4	6.1		8,250	14,850			
			3		37.2	62.8		.7	5.3	86.3	1.4	6.3		8,511	15,320			
Esserville, ¼ mile north-northeast of; J. A. Esser mine No. 4, Blair bed (face of 2 room, 2 left entry, 2,500 feet north.)	75359	B	1	2.9	32.2	61.2	3.7	.8					1.6	8,028	14,450	2,500		49
Same (face of heading, 5 right entry, 3,000 feet north).	75360	B	1	2.3	32.4	58.8	6.5	1.2					1.3	7,761	13,970	2,620		
Same (face of 5 room, 4 right entry, 3000 feet north.)	75361	B	1	2.2	33.8	58.6	5.4	.9					1.0	7,917	14,250	2,600		
Same (composite of samples 75359 to 75361, inclusive).	75362	B	1	2.4	32.8	59.6	5.2	.9	5.3	79.6	1.6	7.4	1.3	7,922	14,260			
			2		33.6	61.1	5.3	.9	5.1	81.6	1.6	5.5		8,122	14,620			
			3		35.5	64.5		1.0	5.4	86.2	1.7	5.7		8,578	15,440			
Flat Gap, 2 miles east of; Reuben Bolling mine, Kelly bed (in entry, 15 feet from mine mouth).	15174	B	1	6.9	30.4	54.6	8.1	1.0					5.8	7,211	12,980	2,720	85	
			2		32.6	58.7	8.7	1.0						7,744	13,940			
Georgel; Swansea mine, Upper Banner bed (21 room, 17 west entry, 2,600 feet from mine mouth).	10386	B	1	2.5	31.7	60.3	5.5	.5	5.6	79.7	1.6	7.1	1.5	7,917	14,250	2,520	22	
			2		32.5	61.8	5.7	.5	5.4	81.7	1.6	5.1		8,117	14,610			
			3		34.5	65.5		.6	5.8	86.6	1.7	5.3		8,606	15,490			
Glamorgan, Glamorgan No. 3 mine, Dorchester bed (face of 2 dip entry, 6,000 feet from mine mouth).	15100	B	1	2.7	33.1	59.2	5.0	1.4					1.6	7,900	14,220	2,130	85	
			2		34.0	60.9	5.1	1.4						8,111	14,600			
Same (face of Glady entry, 7,000 feet from mine mouth).	15101	B	1	3.3	31.3	59.0	6.4	.9	5.3	78.0	1.7	7.7	2.0	7,728	13,910	2,190	85	
			2		32.4	61.0	6.6	.9	5.1	80.7	1.7	5.0		7,989	14,380			
			3		34.6	65.4		1.0	5.4	86.3	1.8	5.5		8,550	15,390			
Same (1½ miles northeast of mine mouth)	32842	B	1	2.5	31.8	59.3	6.4	1.3					1.2	7,783	14,010	2,370		50
Same	32843	B	1	2.8	33.4	59.7	4.1	1.0					1.5	7,989	14,380	2,220		

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WISE COUNTY—continued																		
Glamorgan; Glamorgan No. 3 mine, Dorchester bed (composite of samples 32842 and 32843).	32844	B	1	2.6	32.9	59.3	5.2	1.1	5.3	79.7	1.7	7.0	1.3	7,883	14,190	------	------	------
			2	------	33.8	60.9	5.3	1.1	5.1	81.8	1.7	5.0	------	8,100	14,580	------	------	------
			3	------	35.7	64.3	------	1.2	5.4	86.4	1.8	5.3	------	8,550	15,390	------	------	------
Imboden; Imboden No. 2 mine, Imboden bed (manhole on left wall of main line midway between 7 and 8 left entries, 2,000 feet in).	75972	B	1	2.8	34.4	58.2	4.6	.9	------	------	------	------	1.3	7,811	14,060	------	------	50
Same (face of main heading, 8 left entry, 3,500 feet northwest of drift).	75973	B	1	2.5	34.8	57.4	5.3	.9	------	------	------	------	1.1	7,772	13,990	2,450	------	------
Same (pillar between 18 and 19 rooms, 6 right entry, 3,500 feet northwest of drift.)	75974	B	1	2.8	33.4	59.2	4.6	.8	------	------	------	------	.9	7,767	13,980	2,680	------	------
Same (composite of samples 75972 and 75974, inclusive).	75975	B	1	2.6	34.1	58.4	4.9	.9	5.3	78.4	1.5	9.0	1.1	7,767	13,980	------	------	------
			2	------	35.1	59.9	5.0	.9	5.2	80.5	1.6	6.8	------	7,978	14,360	------	------	------
			3	------	36.9	63.1	------	1.0	5.4	84.7	1.6	7.3	------	8,400	15,120	------	------	------
Inman, ½ mile north of; Virginia Iron, Coal & Coke No. 2 mine, Imboden bed (pillar at old heading, old main line aircourse), 3,600 feet northwest of drift mouth.	75969	B	1	2.5	35.7	56.2	5.6	.7	------	------	------	------	1.2	7,711	13,880	2,390	------	51
Same (face of 3 right heading, 2,300 feet northwest of drift mouth).	75970	B	1	2.3	34.7	54.8	8.2	.8	------	------	------	------	.8	7,467	13,440	2,390	------	------
Same (composite of samples 75969 and 75970)	75971	B	1	2.3	35.2	55.5	7.0	.8	5.3	76.4	1.5	9.0	1.0	7,589	13,660	------	------	------
			2	------	36.1	56.7	7.2	.8	5.1	78.2	1.6	7.1	------	7,761	13,980	------	------	------
			3	------	38.9	61.1	------	.9	5.5	84.3	1.7	7.6	------	8,372	15,070	------	------	------
Josephine; Intermont No. 6 mine, Dorchester bed (in pillar between 5 and 6 rooms, 50 feet from face of 6 room).	32067	A	1	2.5	33.7	53.6	10.2	.8	------	------	------	------	.9	7,378	13,280	2,640	193	------
Same (7 room, 20 feet through the pillar from fire).	32068	A	1	2.8	33.5	54.0	9.7	1.0	------	------	------	------	1.3	7,372	13,270	2,540	193	------
Same (composite of samples 32067 and 32068)	32069	A	1	2.6	33.8	53.6	10.0	.9	5.1	73.7	1.6	8.7	1.0	7,372	13,270	------	193	------
			2	------	34.7	55.0	10.3	.9	4.9	75.7	1.6	6.6	------	7,572	13,630	------	------	------
			3	------	38.7	61.3	------	1.0	5.5	84.4	1.8	7.3	------	8,439	15,190	------	------	------
Norton, ½ mile northeast of; Norton No. 2 mine, Dorchester bed (face of 1 room, 5 right entry, 2,000 feet north.)	75363	B	1	3.3	35.1	54.8	6.8	2.1	------	------	------	------	2.2	7,606	13,690	2,140	------	51

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Same (100 feet from head of 3 left entry, 2,000 feet north).	75364	B	1	2.8	35.6	56.7	4.9	2.3					1.5	7,778	14,000	2,140		
Same (face of 1 room, 4 left entry, 1,500 feet north.)	75365	B	1	2.3	34.1	55.4	8.2	2.3					1.1	7,606	13,690	2,190		
Same (composite of samples 75363 to 75365, inclusive).	75366	B	1	2.9	34.5	56.0	6.6	2.2	5.4	76.8	1.4	7.6	1.6	7,672	13,810			
			2		35.5	57.7	6.8	2.2	5.2	79.2	1.5	5.1		7,906	14,230			
			3		38.1	61.9		2.4	5.6	85.0	1.6	5.4		8,483	15,270			
½ mile east of; Norton No. 4 mine, Blair bed (1 left headway, off 4 entry).	10390	B	1	3.3	32.8	60.1	3.8	.9	5.6	80.0	1.6	8.1	1.9	7,894	14,210	2,600	22	
			2		33.9	62.2	3.9	.9	5.4	82.8	1.6	5.4		8,167	14,700			
			3		35.3	64.7		1.0	5.6	86.1	1.7	5.6		8,494	15,290			
Osaka; Osaka mine, Imboden bed (1½ miles northeast of mine mouth).	33182	B	1	1.8	34.9	59.2	4.1	.6					.8	8,028	14,450	2,950		52
Same	33183	B	1	2.3	35.0	58.7	4.0	.7					1.1	7,989	14,380	2,970		
Same	33184	B	1	2.7	33.9	55.4	8.0	.8					1.6	7,572	13,630	2,980		
Same (composite of samples 33182 to 33184, inclusive).	33185	B	1	2.2	34.0	58.4	5.4	.7	5.2	79.3	1.5	7.9	1.2	7,850	14,130			
			2		34.8	59.7	5.5	.7	5.1	81.0	1.5	6.2		8,022	14,440			
			3		36.8	63.2		.8	5.4	85.8	1.6	6.5		8,494	15,290			
Pardee, 1 mile northwest of; Pardee No. 1 mine, Pardee bed (2 right entry, main 3 face entry).	22277	B	1	3.0	35.9	55.5	5.6	.8					1.4	7,761	13,970		123	
Same (face of main 3 face entry)	22278	B	1	2.9	36.1	56.2	4.8	.9					1.3	7,811	14,060		123	
Same (6 left entry, main entry)	22279	B	1	2.7	36.3	54.5	6.5	1.4					1.1	7,694	13,850	2,420	123	
Same (composite of samples 22277 to 22279, inclusive).	22280	B	1	2.9	36.1	55.4	5.6	1.1	5.5	78.2	1.7	7.9	1.3	7,756	13,960		123	
			2		37.2	57.0	5.8	1.1	5.3	80.5	1.7	5.6		7,983	14,370			
			3		39.5	60.5		1.2	5.7	85.4	1.8	5.9		8,467	15,240			
Same (face of main entry, 2,000 feet from mine mouth).	15099	B	1	2.3	33.8	54.7	9.2	1.6	5.0	74.5	1.6	8.1	1.0	7,422	13,360	2,500	85	
			2		34.6	56.0	9.4	1.6	4.9	76.2	1.6	6.3		7,594	13,670			
			3		38.2	61.8		1.8	5.4	84.1	1.8	6.9		8,389	15,100			
Same (1 mile northwest of mine mouth)	33140	B	1	3.3	31.8	54.2	10.7	1.1					2.0	7,128	12,830	2,890		53
Same (½ mile east of mine mouth)	33141	B	1	2.5	34.3	55.4	7.8	1.3					1.3	7,544	13,580	2,950		
Same (composite of samples 33140 and 33141)	33142	B	1	3.0	32.9	54.9	9.2	1.2	5.0	74.3	1.6	8.7	1.6	7,333	13,200			
			2		33.9	56.6	9.5	1.2	4.8	76.6	1.6	6.3		7,561	13,610			
			3		37.5	62.5		1.4	5.3	84.7	1.8	6.8		8,356	15,040			
Same (on pillar opposite 15 room, 2 right entry, 3 face entry).	84357	B	1	3.8	32.4	53.7	10.1	1.4					3.1	7,216	12,990	2,620		
Same (face of 6 room, in Goda heading)	84358	B	1	2.6	35.2	57.5	4.7	.8					1.8	7,793	14,030	2,910		
Same (11 room, 6 right entry, 3 face entry)	84359	B	1	2.0	35.4	56.8	5.8	.9					1.3	7,744	13,940	2,850		
Same (8 room, 9 right entry, 3 face entry)	84360	B	1	2.4	35.3	55.5	6.8	.9					1.6	7,614	13,710	2,850		
Same (at 4 face heading, 250 feet from first radius).	84361	B	1	2.4	35.7	55.8	6.1	.9					1.6	7,682	13,830	2,800		
Same (pillar, 300 feet from haulway to 1 right entry, off angle heading).	84362	B	1	2.2	37.8	56.1	3.9	1.0					1.5	7,914	14,240	2,800		
Same (composite of samples 84357 to 84362, inclusive).	84363	B	1	2.5	35.2	56.1	6.2	.9	5.3	77.1	1.7	8.8	1.8	7,639	13,750			
			2		36.1	57.5	6.4	1.0	5.2	79.1	1.7	6.6		7,835	14,110			
			3		38.6	61.4		1.0	5.6	84.6	1.9	6.9		8,371	15,070			
Pardee No. 4 mine, Pardee bed (11 room, 3 left butt entry, 1 straight right entry).	84364	B	1	5.1	32.5	56.4	6.0	.8					4.3	7,343	13,210	2,800		54
Same (10 room, main entry)	84365	B	1	2.0	35.3	55.7	7.0	1.1					1.4	7,585	13,650	2,800		
Same (composite of samples 84364 and 84365)	84366	B	1	3.6	33.7	56.2	6.5	.9	5.3	75.7	1.6	10.0	2.8	7,483	13,470			
			2		35.0	58.2	6.8	1.0	5.0	78.5	1.7	7.0		7,758	13,970			
			3		37.5	62.5		1.0	5.4	84.2	1.8	7.6		8,323	14,980			

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TABLE 2.—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate						Calorific value		Softening temperature (°F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Air-drying loss	Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WISE COUNTY—continued																		
Roaring Fork; Roaring Fork mine, Kelly bed (½ mile east of mine mouth).	33143	B	1	2.0	33.6	56.6	7.8	0.9	.....	.....	.....	.....	.9	7,656	13,780	2,890	.....	55
Same	33144	B	1	2.7	33.3	59.0	5.0	.9	.....	.....	.....	.....	1.6	7,872	14,170	2,370	.....	.....
Same (composite of samples 33143 and 33144)	33145	B	1	2.3	33.8	57.4	6.5	.9	4.9	78.1	1.5	8.1	1.3	7,556	13,960	.....	.....	.....
	.....	.....	2	.....	34.6	58.7	6.7	1.0	4.8	79.9	1.6	6.0	.....	7,933	14,280	.....	.....	.....
	.....	.....	3	.....	37.0	63.0	.....	1.0	5.1	85.6	1.7	6.6	.....	8,500	15,300	.....	.....	.....
Roda; Roda No. 3 mine, Taggart bed (½ mile north of mine mouth).	33203	B	1	2.2	34.7	60.7	2.4	.6	.....	.....	.....	.....	1.0	8,150	14,670	2,370	.....	55
Same	33204	B	1	2.0	35.2	60.4	2.4	.5	.....	.....	.....	.....	.8	8,167	14,700	2,190	.....	.....
Same	33205	B	1	2.0	34.7	61.4	1.9	.5	.....	.....	.....	.....	.8	8,194	14,750	2,370	.....	.....
Same	33206	B	1	2.0	35.5	60.3	2.2	.5	.....	.....	.....	.....	.7	8,189	14,740	2,340	.....	.....
Same (composite of samples 33203 to 33206, inclusive).	33207	B	1	2.1	34.9	60.8	2.2	.5	5.3	82.8	1.5	7.7	.8	8,161	14,690	.....	.....	.....
	.....	.....	2	.....	35.6	62.2	2.2	.6	5.2	84.5	1.5	6.0	.....	8,333	15,000	.....	.....	.....
	.....	.....	3	.....	36.4	63.6	.....	.6	5.3	86.5	1.6	6.0	.....	8,528	15,350	.....	.....	.....
Stonega; Stonega No. 3 mine, Imboden bed (11 heading, 5 left face.)	10388	B	1	2.2	33.1	58.2	6.5	.7	5.3	77.9	1.5	8.1	.8	7,772	13,990	.....	22	.....
	.....	.....	2	.....	33.8	59.6	6.6	.7	5.2	79.6	1.5	6.4	.....	7,944	14,300	.....	.....	.....
	.....	.....	3	.....	36.2	63.8	.....	.8	5.5	85.2	1.6	6.9	.....	8,511	15,320	.....	.....	.....
Same (1 mile southeast of mine mouth)	33186	B	1	2.4	33.6	53.6	10.4	.8	.....	.....	.....	.....	1.3	7,394	13,310	2,870	.....	56
Same (1 mile east of mine mouth)	33187	B	1	2.0	35.0	57.7	5.3	.7	.....	.....	.....	.....	.9	7,917	14,250	2,960	.....	.....
Same (composite of samples 33186 and 33187)	33189	B	1	2.2	33.7	56.4	7.7	.8	5.1	77.2	1.5	7.7	1.1	7,661	13,790	.....	.....	.....
	.....	.....	2	.....	34.5	57.6	7.9	.8	4.9	79.0	1.5	5.9	.....	7,833	14,100	.....	.....	.....
	.....	.....	3	.....	37.5	62.5	.....	.8	5.4	85.8	1.6	6.4	.....	8,506	15,310	.....	.....	.....
Stonega No. 2 mine, Imboden bed (1 mile southeast of mine mouth).	33188	B	1	2.0	34.6	58.5	4.9	.8	.....	.....	.....	.....	.7	7,911	14,240	2,980	.....	56
	.....	.....	2	.....	35.3	59.7	5.0	.8	.....	.....	.....	.....	.....	8,078	14,540	.....	.....	.....
St. Paul; Twin City No. 1 mine, Raven bed (face of main heading, ¼ mile northeast of mine mouth).	32275	B	1	1.8	34.8	50.9	12.5	2.2	4.9	72.0	1.4	7.0	.8	7,144	12,860	2,240	.....	57
	.....	.....	2	.....	35.4	51.9	12.7	2.2	4.8	73.4	1.4	5.5	.....	7,278	13,100	.....	.....	.....
	.....	.....	3	.....	40.5	59.5	.....	2.5	5.5	84.0	1.6	6.4	.....	8,333	15,000	.....	.....	.....
Twin City No. 2 mine, Jawbone bed (face of main heading, 300 feet north 20° east of mine mouth).	32276	B	1	3.0	29.3	54.9	12.8	.7	4.8	72.3	1.4	8.0	1.9	7,056	12,700	2,910	.....	57
	.....	.....	2	.....	30.2	56.6	13.2	.7	4.6	74.5	1.5	5.5	.....	7,272	13,090	.....	.....	.....
	.....	.....	3	.....	34.8	65.2	.....	.8	5.3	85.8	1.7	6.4	.....	8,383	15,090	.....	.....	.....
Twin City No. 3 mine, Jawbone bed (face of main heading, ½ mile north 20° east of mine mouth).	32277	B	1	2.1	29.9	48.6	19.4	1.0	4.4	66.8	1.3	7.1	.8	6,539	11,770	2,240	.....	57
	.....	.....	2	.....	30.6	49.5	19.9	1.0	4.3	68.2	1.3	5.3	.....	6,678	12,020	.....	.....	.....
	.....	.....	3	.....	38.1	61.9	.....	1.3	5.3	85.1	1.6	6.7	.....	8,333	15,000	.....	.....	.....
Sutherland, 1 mile northwest of; Clark No. 2 mine, Dorchester bed (face of heading, 2 left aircourse, 3 right entry, 4,000 feet south of mine mouth).	75436	B	1	2.4	36.1	55.0	6.5	2.3	.....	.....	.....	.....	1.1	7,756	13,960	2,180	.....	57

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Same (face of monkey heading, main line, 5,000 feet southwest of mine mouth).	75437	B	1	5.3	34.7	53.4	6.6	2.6					3.7	7,806	13,510	2,100		
Same (face of heading, 4 left aircourse, 3 right entry, 5,000 feet south of mine mouth).	75438	B	1	2.8	34.7	56.3	6.2	2.0					1.5	7,750	13,950	2,110		
Same (composite of samples 75436 to 75438, inclusive).	75439	B	1	3.4	34.5	55.7	6.4	2.3	5.3	76.5	1.5	8.0	2.1	7,633	13,740			
			2		35.7	57.7	6.6	2.4	5.1	79.2	1.6	5.1		7,906	14,230			
			3		38.3	61.7		2.6	5.5	84.9	1.7	5.3		8,467	15,240			
Tacoma, 1 mile north of; Beaver Coal Co. mine, Lower Banner bed (face of heading, main right entry, 1,300 feet southeast of mine mouth).	75446	B	1	2.9	31.3	54.6	11.2	.9					1.4	7,239	13,030	2,910		58
Same (left wall, 20 feet from face of heading, left straight main entry, 1,000 feet east of mine mouth).	75447	B	1	1.9	33.2	55.6	9.3	1.1					.6	7,589	13,660	2,720		
Same (composite of samples 75446 and 75447)	75448	B	1	2.4	32.7	54.6	10.3	1.0	5.0	74.7	1.6	7.4	1.0	7,439	13,390			
			2		33.5	56.0	10.5	1.0	4.9	76.6	1.6	5.4		7,622	13,720			
			3		37.5	62.5		1.1	5.5	85.6	1.8	6.0		8,517	15,330			
Bolling Coal Co. mine, Raven bed (face of 3 room, main entry, 350 feet north of mine mouth).	75443	B	1	2.6	31.5	58.5	7.4	1.0					1.2	7,628	13,730	2,590		58
Same (face of 5 room, left main entry, 550 feet north of mine mouth).	75444	B	1	2.5	32.2	59.7	5.6	.8					1.1	7,839	14,110	2,560		
Same (composite of samples 75443 and 75444)	75445	B	1	2.6	32.0	58.9	6.5	1.0	5.1	78.6	1.5	7.2	1.1	7,744	13,940			
			2		32.8	60.5	6.7	1.0	5.0	80.7	1.6	5.0		7,950	14,310			
			3		35.2	64.8		1.0	5.3	86.4	1.7	5.6		8,522	15,340			
Toms Creek, Caney mine, Upper Banner bed (3 miles northeast of mine mouth).	32407	B	1	2.5	32.8	58.3	6.4	.5					1.5	7,822	14,080	2,370		59
Same (3¼ miles northeast of mine mouth)	32408	B	1	2.2	32.3	59.6	5.9	.6					1.4	7,867	14,160	2,640		
Same (composite of samples 32407 and 32408)	32409	B	1	2.2	32.4	59.2	6.2	.6	5.2	79.7	1.6	6.7	1.4	7,850	14,130			
			2		33.2	60.5	6.3	.6	5.1	81.5	1.7	4.8		8,028	14,450			
			3		35.4	64.6		.6	5.4	87.1	1.8	5.1		8,572	15,430			
Coburn mine, Upper Banner bed (17 east heading, 3,000 feet northeast of mine mouth).	2281	A	1	2.7	32.5	60.3	4.5	.5					1.6	8,022	14,540		22	
			2		33.4	62.0	4.6	.5						8,306	14,950			
Same (3 room, 11 west heading, 2,000 feet northeast of mine mouth).	2282	A	1	2.9	32.0	61.0	4.1	.6					1.7				22	
			2		33.0	62.7	4.3	.6										
1½ miles northwest of; Cranesnest No. 1 mine, Upper Banner bed (1,500 feet southwest of entrance to main entry on Caney Creek).	18226	B	1	2.5	33.4	59.3	4.8	.6					1.5	8,033	14,460	2,510	123	
Same (500 feet northeast of entrance of main opening on Caney Creek).	18227	B	1	2.3	32.9	59.9	4.9	.5					1.5	8,033	14,460	2,580	123	
Same (4,100 feet southeast of entrance of main opening on Caney Creek).	18228	B	1	2.3	32.7	59.2	5.8	.5					1.4	7,983	14,370	2,660	123	
Same (composite of samples 18226 to 18228, inclusive).	18229	B	1	2.3	32.9	59.6	5.2	.5	5.2	80.8	1.6	6.7	1.5	8,011	14,420		123	
			2		33.6	61.1	5.3	.6	5.1	82.7	1.6	4.7		8,200	14,760			
			3		35.5	64.5		.6	5.3	87.3	1.7	5.1		8,661	15,590			
Lee No. 6 mine, Upper Banner bed (500 feet east of mine mouth, 60 feet from outcrop).	32410	B	1	3.9	32.4	58.1	5.6	.5					2.3	7,761	13,970	2,580		59
Same (½ mile northeast of mine mouth)	32411	B	1	2.0	33.1	60.3	4.6	.5					.9	8,000	14,400	2,370		
Same (composite of samples 32410 and 32411)	32412	B	1	2.8	33.0	59.0	5.2	.6	5.3	80.1	1.6	7.2	1.6	7,856	14,140			
			2		34.0	60.6	5.4	.6	5.1	82.4	1.7	4.8		8,089	14,560			
			3		35.9	64.1		.6	5.4	87.1	1.8	5.1		8,544	15,380			
Sexton No. 2 mine, Upper Banner bed (2½ miles northeast of mine mouth).	32413	B	1	3.2	30.4	52.0	14.4	.6	4.9	71.3	1.5	7.3	2.1	7,033	12,660	2,380		60
			2		31.4	53.8	14.8	.6	4.7	73.7	1.5	4.7		7,267	13,080			
			3		36.9	63.1		.7	5.5	86.5	1.8	5.5		8,533	15,360			

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TABLE 2—*Analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air-drying loss	Calorific value		Softening temperature (° F.)	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WISE COUNTY—continued																		
Toms Creek; Thelma No. 1 mine, Upper Banner bed (½ mile southeast of mine mouth).	32404	B	1	2.7	34.3	56.6	6.4	0.5					1.8	7,789	14,020	2,270		61
Same (1 mile southeast of mine mouth)	32405	B	1	2.8	32.5	53.8	10.9	.6					1.8	7,344	13,220	2,430		
Same (composite of samples 32404 and 32405)	32406	B	1	2.8	33.2	55.4	8.6	.5	5.2	76.3	1.6	7.8	1.8	7,522	13,540			
			2		34.2	57.0	8.8	.5	5.0	78.5	1.6	5.6		7,744	13,940			
			3		37.5	62.5		.6	5.5	86.1	1.8	6.0		8,494	15,290			
Virginia City; Virginia Iron, Coal & Coke Co. No. 1 mine, Jawbone bed (½ mile north of mine mouth).	32503	B	1	1.8	29.7	48.9	19.6	1.4					.7	6,550	11,790	2,470		61
Same	32504	B	1	1.5	31.3	50.2	17.0	1.0					.4	6,778	12,200	2,220		
Same	32505	B	1	1.6	32.3	50.8	15.3	1.8					.6	6,956	12,520	2,220		
Same	32506	B	1	1.5	32.4	49.4	16.7	.8					.4	6,783	12,210	2,380		
Same (composite of samples 32503 to 32506, inclusive).	32507	B	1	1.5	31.4	49.8	17.3	1.3	4.7	68.9	1.3	6.5	.5	6,772	12,190			
			2		31.9	50.5	17.6	1.3	4.6	70.0	1.3	5.2		6,878	12,380			
			3		38.7	61.3		1.5	5.6	84.9	1.6	6.4		8,344	15,020			
Same (sample of bone coal)	32508	B	1	.6	27.8	48.5	23.1	.4						6,339	11,410	2,240		
			2		27.9	48.9	23.2	.4						6,372	11,470			
Same (2,400 feet northwest of mine mouth)	5217	B	1	3.4	28.6	53.0	15.0	1.2					2.2	6,917	12,450		22	
			2		29.6	54.9	15.5	1.2						7,156	12,880			
Same (3,200 feet northwest of mine mouth)	5235	B	1	3.1	27.8	54.2	14.9	1.2					1.8	6,894	12,410		22	
			2		28.7	55.9	15.4	1.3						7,111	12,800			
Wise, 2 miles west of; Dean Bros. mine, Rocky Fork bed (face of main heading, 95 feet north of mine mouth).	75746	B	1	3.4	31.2	59.2	6.2	.8					2.3	7,744	13,940	2,820		62
			2		32.3	61.2	6.5	.8						8,022	14,440			
½ mile south of; Gladeville No. 3 mine, Norton bed (chain pillar, 3 left entry, 700 feet from main line, 3,000 feet from mine mouth).	75367	B	1	3.0	32.7	54.8	9.5	1.4					1.5	7,439	13,390	2,460		62
Same (face of heading, 4 right aircourse, main line, 2,000 feet from mine mouth).	75368	B	1	4.1	33.1	56.1	6.7	1.4					2.5	7,578	13,640	2,270		
Same (south wall of break through, 50 feet from head of 1 and 20 feet off right entry, 2,000 feet from mine mouth).	75369	B	1	2.9	33.5	57.2	6.4	1.5					1.6	7,694	13,850	2,340		
Same (composite of samples 75367 to 75369, inclusive).	75370	B	1	3.3	32.7	56.5	7.5	1.4	5.4	76.2	1.7	7.8	1.9	7,578	13,640			
WYTHE COUNTY			2		33.8	58.4	7.8	1.5	5.2	78.8	1.7	5.0		7,839	14,110			
			3		36.6	63.4		1.6	5.6	85.4	1.9	5.5		8,500	15,300			
Max Meadows, 3 miles north of; Ellison & Johnson prospect, Upper (or Large) bed (10 feet in from opening).	20721	B	1	6.1	11.1	49.8	33.0	.3					5.2	4,972	8,950	3,010	123	
			2		11.9	52.9	35.2	.3						5,300	9,540			

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DESCRIPTION OF SAMPLES

The field notes that follow describe the coal bed worked and its characteristics, the places where the samples were taken, and the general condition of mining.

Table 2 gives the name of the coal bed, the location of the mine, and the chemical analysis. The analysis of any sample may be found by reference to the page number and laboratory number given in the description of samples.

DICKENSON COUNTY

Trammel. Banner No. 2 Mine

Analyses 82438 to 82442 (p. 11). Bituminous coal, Southwest Virginia fields, from Banner No. 2 mine, a drift mine one-fourth mile east of Trammel on the Carolina, Clinchfield & Ohio Railway. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 2 feet 10 inches to 3 feet 2½ inches. Roof, shale; floor, flaky shale. Cover at points of sampling, 200 to 1,000 feet. The bed was measured and sampled at four points by W. G. Forrester, October 21, 1921, as described below.

Sections of coal bed in Banner No. 2 mine

Section	A		B		C		D	
Laboratory No.	82438		82439		82440		82441	
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Roof, shale.								
Coal		6½		5½		7		6
Flinty coal		1½		1½		1		1
Coal	2	5	2	7½	2	5½	2	3
Floor, flaky shale.								
Thickness of bed	3	1	3	2½	3	1½	2	10
Thickness of coal sample	3	1	3	2½	3	1½	2	10

Section A was cut from face of 2 right entry off 1 right main entry, 1,200 feet N. 75° E. of mine mouth; section B was measured at 1 right main entry, 1,700 feet N. 55° E., face of last crosscut; section C was measured at 2 right off main entry, 1,200 feet N. 30° E., at rib near face; section D was measured at main entry, 1,200 feet north of manhole 200 feet from face. The ultimate analysis of a composite sample made by combining face samples 82438 to 82441 is given under laboratory No. 82442.

System of mining, room and pillar. Coal was undercut by machine and shot down with FF black blasting powder and 40 per cent dynamite. At the time of sampling the daily output was 300 tons; no record was kept of the 1920 output. Bar screens were used for screening the coal; coal was picked on cars. All coal was derived from advance workings. In 1921 the life of the mine was estimated at 25 years.

LEE COUNTY

Darbyville. Darby Mine

Analyses 82433 to 82437 (p. 12). Bituminou coal, Southwest Virginia fields, from Darby mine, a drift mine 2¼ miles north of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 2 feet 9½ inches to 3 feet 6 inches; strike, northeast and southwest. Roof, section A, medium shale; B, tender shale; C, tender shale; D, medium shale and good sandstone. Floor, sections A, B, C, and D, rough, flaky shale. Cover at point of sampling, 150 to 300 feet. The

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bed was measured and sampled at four points by W. G. Forrester on October 19, 1921, as described below.

Sections of coal bed in Darby mine

Section	A		B		C		D	
Laboratory No.	82433		82434		82435		82436	
Roof, shale and sandstone.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Coal	1	1		5		1½		
Bone								• ½
"Mother" coal		½				¼		
Splint				1				3
Coal		3¾		7¾		9¾		5¼
"Mother" coal		¼		¾		¼		¼
Coal		9¾		3		6	1	
"Mother" coal		¼		¼		¼		½
Coal		2¼		9		4½	1	
"Mother" coal		¾		½		½		
Coal		11½		11¾	1	6		
Floor, shale.								
Thickness of bed	3	6	3	3	3	5	2	9½
Thickness of sample	3	6	3	3	3	5	2	9

• Not included in sample.

Section A was cut at 8 face of aircourse off 20 butt entry, 3,900 feet east of mine mouth; section B was cut at face of 6 entry off 20 butt entry, 3,600 feet S. 60° E. of mine mouth; section C was cut at face of 9 right, 2 panel wall, 3,500 feet S. 20° E. of mine mouth; section D was cut 1,000 feet east of drift mouth, at No. 6 room pillar. The ultimate analysis of a composite sample made by combining face samples 82433 to 82436 is given under laboratory No. 82437.

System of mining, room, and pillar. In 1921 the coal was cut by machine and shot off the solid with FF and FFF black blasting powder and permissible explosives; 40 per cent of the coal was washed with Montgomery jig washers, and coal was picked on car. Coal was screened with shaker screens. At the time of sampling the daily output was 250 tons of which 60 per cent came from advance workings. Sizes produced were nut and block.

Keokee. Mohawk Coal Co. No. 1 and 2 Mines

Analyses 75747 and 75748 (p. 12). Bituminous coal, Southwest Virginia field, from Mohawk Coal Co. No. 1 and 2 mines, drift mines 2,040 feet above sea level, at Keokee on the Southern Railway. Coal bed, Mohawk; Pennsylvanian series, Wise formation; thickness, 4 feet ½ inch to 4 feet 5 inches; dip, 18°; strike, N. 65° E. Roof, poor shale; floor, soft, smooth shale. Cover at point of sampling, 200 to 250 feet. The bed was measured and sampled at two points by Albert W. Giles, Virginia Geological Survey, August 18, 1920, as described below.

Section of coal bed in Mohawk Coal Co. No. 1 and 2 mines

Section	A		B	
Laboratory No.	75747		75748	
Roof, shale.	Ft.	in.	Ft.	in.
Coal	1			8
Pyritic shale		• 4		• 4½
Coal	1	2	1	2
Shale		• 2		
Pyritic shale				• 1
Coal	1	8	1	6
"Rash"		• 1		
Shale				• 1
Coal				2
Floor, shale.				
Thickness of bed	4	5	4	½
Thickness of sample	3	10	3	6

• Not included in sample.

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Section A was cut in 1 room off straight (main) entry, 3,500 feet east-northeast of drift mouth; section B was cut 1,200 feet northeast of drift mouth in main (dip) heading. The ultimate analysis of a composite sample made by combining face samples 75747 and 75748 is given under laboratory No. 75749.

System of mining, room and pillar. Coal was not undercut. All coal was run of mine and picked on car. At the time of sampling the daily output was 50 tons.

KEOKEE. STONEGA COAL & COKE CO. MINE NO. 1

Analyses 75678 to 75680 (pp. 12 and 13). Bituminous coal, Southwest Virginia fields, from Stonega Coal & Coke Co. No. 1 mine, a drift mine at Keokee on the Southern Railway. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 4 feet 3 inches to 4 feet 9¼ inches; dip, 2°; strike, east-northeast. Roof, shale; floor, smooth shale. Cover at points of sampling, 500 feet. The bed was measured and sampled at two points by Albert W. Giles, Virginia Geological Survey, August 16, 1920, as described below.

Sections of coal bed in Stonega Coal & Coke Co. mine No. 1

Section	A		B	
Laboratory No.	75678		75679	
	Ft.	*in.*	*Ft.*	*in.*
Roof, shale.				
Shaly coal		[a]6		[a]3
Coal		8½	1	5
"Rash"		¼		[a]½
Coal	1	6	2	6½
"Rash"		¼		
Coal		11		
"Rash"		¼		
Coal	1	1		
Floor, shale.				
Thickness of bed	4	9¼	4	3
Thickness of sample	4	3¼	3	11½

[a] Not included in sample.

Section A was cut 4,000 feet northwest of drift mouth, 600 feet on the Kentucky side of the State line, at 14 room off 10 left entry off No. 2 main entry; section B was cut 4,000 feet northwest of drift mouth on the Virginia side at 21 room, 5 right entry off No. 4 main entry. The ultimate analysis of a composite sample made by combining face samples 75678 and 75679 is given under laboratory No. 75680.

System of mining, room and pillar. In 1919 the coal was cut by machine and shot down with black blasting powder and dynamite. Coal was screened with shaker screens. Sizes of coal produced, lump and slack. Coal was picked on car. At time of sampling the daily output was 40 tons.

KEOKEE. STONEGA COAL & COKE CO. MINE NO. 3

Analyses 75675 to 75677 (p. 13). Bituminous coal, Southwest Virginia fields, from Stonega No. 3 mine, a drift mine 2,190 feet above sea level, at Keokee on the Southern Railway. Coal bed, Harlan; Pennsylvanian series, Wise formation; thickness, 6 feet ¾ inch to 7 feet 6½ inches; dip, 2°; strike, east-northeast. Roof, fair shale; floor, soft, smooth shale. Cover at points of sampling, 250 to 500 feet. The bed was measured and sampled at two points by Albert W. Giles, Virginia Geological Survey, August 17, 1920, as described below.

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Sections of coal bed in Stonega Coal & Coke Co. mine No. 3

Section	A	B
Laboratory No.	75675	75676
Roof shale.		
Coal	1	10
Hard, pyritic shale	•10	
"Rash"		•2
Coal	1½	3
Clay	•¼	
Hard, pyritic shale		•2 2
Coal	1 9	•1
"Rash"	•½	
Shale		•2
Coal	1 4	4
"Rash"	•6½	•½
Coal	4	2 9
"Rash"	•1	•3
Coal		6
Floor, shale.		
Thickness of bed	6 ¾	7 6½
Thickness of sample	4 6½	4 8

• Not included in sample.

Section A was cut 500 feet northwest of drift mouth, at face of 5 room off 3 left entry off 2 main entry; section B was cut 3,200 feet northwest of drift mouth in east main aircourse heading. The ultimate analysis of a composite sample made by combining face samples 75675 and 75676 is given under laboratory No. 75677.

System of mining, room and pillar. Coal was undercut by machine and shot down with black blasting powder and dynamite. At time of sampling the daily output was 250 tons. Coal was screened with shaker screens and picked on car. Sizes produced, lump, slack, and run of mine.

Pennington Gap. Penn Lee No. 1 Mine

Analysis 34978 (p. 13) Bituminous coal, Southwest Virginia fields; from Penn Lee No. 1 mine, a drift mine at Pennington Gap, on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Black Mountain; Pennsylvanian series; thickness, 3 feet 6 inches. Roof, shale; floor, shale. Cover at point of sampling, 200 feet. The bed was sampled at one point by Albert W. Giles, of the Virginia Geological Survey, July 22, 1920, as described below.

Section of coal bed in Penn Lee No. 1 mine

Laboratory No.	34978
Roof, shale.	
Coal	2 3
Hard, bony coal	1
Coal	9
Hard, bony coal	1
Coal	4
Floor, shale.	
Thickness of bed	3 6
Thickness of sample	3 6

Sample 34978 was measured at 3 left entry off main heading, 150 feet from 3 room, 1,000 feet northeast of drift mouth.

At the time of sampling, the daily capacity was 200 tons.

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Pennington Gap. Penn Lee No. 4 Mine

Analysis 34979 (p. 13) Bituminous coal, Southwest Virginia fields, from Penn Lee No. 4 mine, a drift mine at Pennington Gap, on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Black Mountain; Pennsylvanian series; thickness, 3 feet 5 inches. Roof, shale; floor, shale. The bed was sampled at one point, having 100 feet of cover, by Albert W. Giles, of the Virginia Geological Survey, July 22, 1920, as described below.

Section of coal bed in Penn Lee No. 4 mine

Laboratory No.	34979	
	Ft.	*in.*
Roof, shale.		
Coal	1	1
Hard, bony coal		1
Coal	1	2
Hard, bony coal		1
Coal	1	
Floor, shale.		
Thickness of bed	3	5
Thickness of sample	3	5

This sample was measured at main heading, 200 feet northeast of drift mouth. At the time of sampling, the daily capacity was 50 tons.

Pennington Gap. Stone Creek Coal Co. No. 1 Mine

Analysis 75905 (p. 13). Bituminous coal, Southwest Virginia fields, from Stone Creek Coal Co. No. 1 mine, a drift mine 1,560 feet above sea level, 3 miles northwest of Pennington Gap on the Southern Railway and Louisville & Nashville Railroad. Coal bed, "Stone Creek"; Pennsylvanian series; thickness, 2 feet 6¼ inches; dip, 2°; strike, northeast. Roof, good sandstone; floor, hard and smooth. The bed was measured and sampled at one point by Albert W. Giles, of the Virginia Geological Survey, September 4, 1920, as described below.

Section of coal bed in Stone Creek Coal Co. No. 1 mine

Laboratory No.	75905	
	Ft.	*in.*
Roof, sandstone.		
Draw slate		• 2½
Coal	1	10½
"Rash"		¼
Coal		5
Floor, sandstone.		
Thickness of bed	2	6¼
Thickness of sample	2	3¾

• Not included in sample.

Sample 75905 was taken at main heading, 150 feet north-northwest of drift mouth. System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. All coal was run of mine and came from advance workings. At the time of sampling the daily output was 6 tons.

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Pennington Gap. Virginia Blue Gem Coal Corporation No. 1 Mine

Analysis 75907 (p. 13). Bituminous coal, Southwest Virginia fields, from No. 1 mine, Virginia Blue Gem Coal Corporation, a drift mine 1,650 feet above sea level, 3½ miles northeast of Pennington Gap on the Southern Railway. Coal bed, "North Fork"; Pennsylvanian series; thickness, 6 feet 10 inches; dip, 2½°; strike, east-northeast. Roof, good shale; floor, hard, smooth shale. The bed was measured and sampled at one point by D. C. Long, of the United States Geological Survey, August 30, 1920, as described below.

Section of coal bed in Virginia Blue Gem Coal Corporation No. 1 mine

Laboratory No.	75907	
	Ft.	*in.*
Roof, shale.		
Coal	3	
Shale		•4
Coal	3	6
Floor, shale.		
Thickness of bed	6	10
Thickness of sample	6	6

• Not included in sample.

Sample 75907 was taken at 1 room off first right entry off main entry, 400 feet northeast of drift mouth. System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. All coal is run of mine, from advance workings. In 1919 the life of the mine was estimated at 20 years.

Pennington Gap. Emerald Coal Co. No. 1 Mine

Analysis 75787 (p. 13). Bituminous coal, Southwest Virginia fields, from No. 1 mine, Emerald Coal Co., a drift mine 1,720 feet above sea level, 3½ miles north of Pennington Gap on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Harlan; Pennsylvanian series, Wise formation; thickness, 4 feet ½ inch. Dip, 1½°; strike, N. 60° E. Roof, good shale; floor, hard smooth shale. The bed was measured and sampled at one point by Albert W. Giles of the Virginia Geological Survey, August 24, 1920, as described below.

Section of coal bed in Emerald Coal Co. No. 1 mine

Laboratory No.	75787	
	Ft.	*in.*
Roof, shale.		
Coal		3
"Rash"		•1½
Coal	1	
Pyritic shale		•2½
Bone coal		10
Coal	1	4
Pyritic shale		•½
Coal		•½
Pyritic shale		•½
Bone		2
Floor, shale.		
Thickness of bed	4	½
Thickness of sample	3	7

• Not included in sample.

Sample 76787 was cut at face of main heading, 1 entry, 500 feet south-southeast of drift mouth. System of mining, room and pillar. Coal was shot down with black blasting powder. All coal was run of mine and was picked on car and in bin. Coal came from advance workings. In 1919 the life of the mine was estimated at 25 years.

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St. Charles. Black Diamond No. 1 Mine

Analysis 34981 (p. 13). Bituminous coal, Southwest Virginia fields, from Black Diamond No. 1 mine, at St. Charles, on the Southern Railway. Coal bed, Jack Rock (No. 3); Pennsylvanian series; thickness, 3 feet 8½ inches. Roof, shale; floor, shale. Cover at point of sampling 100 feet. The bed was sampled at one point by Albert W. Giles, of the Virginia Geological Survey, July 23, 1920, as described below.

Section of coal bed in Black Diamond No. 1 mine

Laboratory No.	34981
	Ft. in.
Roof, shale.	
Coal	7½
Shale	•½
Coal	3¼
Shale	•¼
Coal	6
Hard bony coal	10
Coal	7
Shale	•2
Coal	•8
Floor, shale.	
Thickness of bed	3 8½
Thickness of sample	2 9¾

• Excluded from sample.

This sample was measured at heading of 2 right entry off main entry, 600 feet northeast of drift mouth.

At the time of sampling the daily capacity was 50 tons.

St. Charles. St. Charles Coal Co. No. 1 Mine

Analysis 75906 (p. 13). Bituminous coal, Southwest Virginia fields, from St. Charles Coal Co. No. 1 mine, a drift mine 1,570 feet above sea level, at St. Charles on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Standiford; Pennsylvanian series, Wise formation; thickness, 2 feet 7 inches; dip, 1°; strike, east of northeast. Roof, good shale; floor, hard, smooth. The bed was measured and sampled at one point by Albert W. Giles of the Virginia Geological Survey, August 30, 1920, as described below.

Section of coal bed in St. Charles Coal Co. No. 1 mine

Laboratory No.	75906
	Ft. in.
Roof, shale.	
Draw slate	•3
Coal	1 2
Shaly coal	1 2
Floor, shale.	
Thickness of bed	2 7
Thickness of sample	2 4

• Not included in sample.

Sample 75906 was cut at heading off main entry, 350 feet southeast of drift mouth. System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. All coal was run of mine and came from advance workings. At the time of sampling the daily output was 30 tons.

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St. Charles. Virginia Lee No. 1 Mine

Analysis 34980 (p. 13). Bituminous coal, Southwest Virginia fields, from Virginia Lee No. 1 mine at St. Charles, on the Southern Railway. Coal bed, Taggart; Pennsylvanian series; Wise formation; thickness, 3 feet 7 inches. Roof, shale; floor, shale. Cover at point of sampling, 500 feet. The bed was sampled at one point by Albert W. Giles of the Virginia Geological Survey, July 23, 1920.

Sample 34980 was measured at 19 room off 10 left entry, off 1 main entry, 500 feet west-northwest of drift mouth.

At the time of sampling the daily capacity was 250 tons.

St. Charles. Bondurant No. 3 Mine

Analyses 82423 to 82427 (pp. 13–14). Bituminous coal, Southwest Virginia fields, from Bondurant No. 3 mine, United Collieries Co., Inc., a drift mine 1 mile northeast of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 3 feet 9¾ inches to 4 feet 7 inches. Roof, tender shale; floor, hard, rough shale. The bed was measured and sampled at four points by W. A. Forrester, October 17, 1921, as described below.

Sections of coal bed in Bondurant No. 3 mine

Section	A	B	C	D
Laboratory	82423	82424	82425	82426
Roof, shale.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Soft shaly coal	1½	4		
Splint coal	7	6	7½	
Shaly coal				*7
Splint coal				6½
"Mother" coal			1	
Coal	2½	2¾	3½	5¾
"Mother" coal	¼	¼	¼	¼
Coal	4	4½		1¼
Hard flinty coal			2½	
Splint	1¾	2		1
Coal		4½	2 7	
"Mother" coal	¼	¼		¼
Coal	5	3		4
"Mother" coal	½	½		½
Coal	1 1¼	4½		2¼
"Mother" coal	¼	½		¼
Coal	1 ¼	6½		6
"Mother" coal		½		¼
Coal		11¾		1 6¾
"Mother" coal				
Coal				
Floor, shale.				
Thickness of bed	4 ½	4 3½	3 9¾	4 6
Thickness of sample	4 ½	4 3½	3 9¾	3 11

* Not included in sample.

Section A (sample 82423) was taken at rib at face of 5 entry, 500 feet southwest of drift mouth; section B (sample 82424) was taken at rib at face of crosscut off 4 entry, 200 feet south of mine mouth; section C (sample 82425) was taken at rib at face of 3 cross entry, 400 feet southeast of mine mouth; section D (sample 82426) was taken at rib at face of 2 entry, 500 feet northeast of mine mouth. The ultimate analysis of a composite sample made by combining face samples 82423 to 82426 is given under laboratory No. 82427.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. At the time of sampling the daily output was 175 tons; the output in 1920 was 41,000 tons. All coal came from advance workings. Coal was picked on railroad cars. All coal was run of mine. This mine was working the small blocks of coal left in the old Bondurant mine. In 1920 the life of the mine was estimated at 2 years.

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St. Charles. Dominion Mine

Analyses 82428 to 82432 (p. 14). Bituminous coal, Southwest Virginia fields, from Dominion mine, United Collieries, Inc., a drift mine 1 mile northwest of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 3 feet 2½ inches to 3 feet 4¾ inches; dip, 1° northwest. Roof, shale and sandstone; floor, shale. The bed was measured and sampled at four points by W. A. Forrester, October 18, 1921, as described below.

Sections of coal bed in Dominion mine

Section Laboratory No.	A 82428	B 82429	C 82430	D 82431
	Ft. in.	*Ft. in.*	*Ft. in.*	*Ft. in.*
Roof, shale and sandstone.				
Coal	7½	5¼	7½	2
Splint	1½		1	
"Mother" coal		¼		¼
Coal	1	3¼	3½	3¾
"Mother" coal	½	¼	¼	¼
Coal	1	8½		9½
"Mother" coal	½	½		¼
Coal	4½	1 ½	4½	1 5
"Mother" coal	¼	½	½	½
Coal	1 1	8½	7¼	7
"Mother" coal	½		¼	
Coal	8¼		3½	
"Mother" coal			½	
Coal			10	
Floor, shale.				
Thickness of bed	3 2½	3 3½	3 3	3 4¾
Thickness of sample	3 2½	3 3½	3 3	3 4¾

Section A (sample 82428) was taken at 8 left off No. 3 main, 3,300 feet N. 15° E. of drift mouth at rib near face; section B (sample 82429) was taken at cross haulage off 8 right, No. 1 main, 2,900 feet N. 10° W. at face; section C (sample 82430) was taken at 8 right off No. 1 main, 3,000 feet north, at face of entry; section D (sample 82431) was taken at 7 left off No. 1 main, 2,900 feet N. 30° W. at face of 1 room on right. The ultimate analysis of a composite sample made by combining face samples 82428 to 82431 is given under laboratory No. 82432.

System of mining, room and pillar. The coal was undercut by machines and shot down with FF black blasting powder and 40 per cent dynamite. At the time of sampling the daily output was 350 tons, and the maximum daily output was 600 tons, the 1920 output was 53,000 tons. The proportion of the output from advance workings was 95 per cent; 60 per cent of coal was run of mine. Coal was screened through shaker screens and picked on table. At the time of sampling the life of the mine was estimated at 30 years.

St. Charles. Freeheart Coal Co. No. 1 Mine

Analysis 75908 (p. 14). Bituminous coal, Southwest Virginia fields, Virginia district, from Freeheart Coal Co. No. 1 mine, a drift mine 1,700 feet above sea level, 1½ miles west of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Standiford; Pennsylvanian series, Wise formation; thickness, 3 feet 3 inches; dip, 1°; strike, east-northeast. Roof, good shale; floor, hard, smooth. Cover at point of sampling, 100 feet. The bed was measured and sampled at one point by Albert W. Giles, Virginia Geological Survey, August 30, 1920, as described below.

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Section of coal bed in Freeheart Coal Co. No. 1 mine

Laboratory No.	75908	
	Ft.	*in.*
Roof, shale.		
Clay		*½
Coal		4
Pyritic shale		*½
Coal		2½
Pyritic shale		*½
Coal	1	6
Shaly coal		9
Coal		4
Floor, shale.		
Thickness of bed	3	3
Thickness of sample	3	1½

* Not included in sample.

Sample 75908 was taken at face of 1 room off main entry, 60 feet west of drift mouth. System of mining, room and pillar. Coal was cut by hand. All coal was run of mine, and came from advance workings. At the time of sampling the daily output was estimated at 25 tons. In 1919 the life of the mine was indefinite.

St. Charles. Tomlinson & Pearly Coal Co. No. 1 Mine

Analysis 75909 (p. 14). Bituminous coal, Southwest Virginia fields, from Tomlinson & Pearly Coal Co. No. 1 mine, a drift mine 1,620 feet above sea level, 1½ miles east of St. Charles on the Southern Railway and Louisville & Nashville Railroad. Coal bed, "No. 2"; Pennsylvanian series, Wise formation; thickness of bed, coal, and sample, 2 feet 7 inches. Roof, good shale; floor, hard, smooth. Cover at point of sampling, 75 feet. The bed was measured and sampled at one point by Albert W. Giles for the Virginia Geological Survey, August 30, 1920.

Sample was taken 150 feet northwest of drift mouth, from rib of main entry, at face of left entry. System of mining, room and pillar. All coal was run of mine, and came from advance workings. At the time of sampling the daily output was 10 tons. In 1919 the life of the mine was indefinite.

St. Charles. Kirk Mine

Analyses 82418 to 82422 (pp. 14–15). Bituminous coal, Southwest Virginia fields, from Kirk mine, Wilma Coal Co., a drift mine, 2 miles north of St. Charles fields, on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Taggart (No. 5); Pennsylvanian series, Wise formation; thickness, 3 feet 3 inches to 3 feet 6 inches; dip, 2°; strike, southwest-northeast. Roof, section A, medium shale; section B, immediate shale medium, main sandstone good; section C, medium shale; section D, medium shale. Floor, shale. Cover at point of sampling, 50 to 150 feet. The bed was measured and sampled at four points by W. A. Forrester, October 14, 1921, as described below.

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Sections of coal bed in Kirk mine, Wilma Coal Co.

Section	A	B	C	D
Laboratory No.	82418	82419	82420	82421
Roof, shale and sandstone.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	6	5¼	9¾	
Splint	1	2		1½
"Mother" coal			¼	
Coal	5¾	10	6½	7
"Mother" coal	¼	¼	½	½
Coal splint				1
"Mother" coal				¼
Coal	1	1 11	1½	9
"Mother" coal	½		½	½
Coal	4¼		1 1½	1 10¾
"Mother" coal	¼		½	
Coal	1		6½	
"Mother" coal	1			
Coal	1 8½			
Floor, shale.				
Thickness of bed	3 6	3 4½	3 3½	3 6½
Thickness of sample	3 6	3 4½	3 3½	3 6½

Section A (sample 82418) was taken near 3 room pillar at 1 right entry off 1 left main entry, 600 feet north of mine mouth; section B (sample 82419) was taken at rib near face at 4 right off main entry, 500 feet N. 15° E. of mine mouth; section C (sample 82420) was cut at face of 4 room crosscut 2 right off 1 left main entry, 900 feet north of mine mouth; section D (sample 82421) was taken at face of 2 main entry, 800 feet south of No. 1 pit mouth. The ultimate analysis of a composite sample made by combining face samples 82418 to 82421 is given under laboratory No. 82422.

System of mining, room and pillar. In 1920 the coal was shot off the solid with FF black blasting powder; coal was screened with bar screens and came from advance workings. At the time of sampling the daily output was 80 tons; the 1920 output was 6,700 tons. In 1920 the life of the mine was estimated at 5 years.

St. Charles. Old Virginia Coal Co. No. 3 Mine

Analyses 75792 to 75794 (p. 15). Bituminous coal, Southwest Virginia fields, from No. 3 mine, Old Virginia Coal Co., a drift mine, 1,880 feet above sea level, 2½ miles northeast of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 4 feet 9 inches to 5 feet 5½ inches; dip, 1°; strike, east of northeast. Cover at point of sampling, 250 to 500 feet. The bed was measured and sampled at two points by Albert W. Giles of the Virginia Geological Survey, August 27, 1920, as described below.

Sections of coal bed in Old Virginia Coal Co. No. 3 mine

Section	A	B
Laboratory No.	75792	75793
	Ft. in.	Ft. in.
Coal	3	2 2
"Rash"	*½	¼
Coal	9	3½
Draw "slate"	*1 8	
"Rash"		¼
Coal		1 1
Draw "slate"		*8
Coal		2
Draw "slate"		*4
Thickness of bed	5 5½	4 9
Thickness of sample	3 9	3 9

* Not included in sample.

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Section A (sample 75792) was cut in 3 room off 1 left entry off main entry 500 feet northeast of drift mouth; section B (sample 75793) was cut 1 mile northeast of drift mouth, in 6 room off 6 left entry off main entry. The ultimate analysis of a composite sample made by combining face samples 75792 and 75793 is given under laboratory No. 75794.

System of mining, room and pillar. In 1919 coal was cut by machine. Nearly all coal came from advance workings and was picked on car. Coal was screened with shaker screens; sizes produced are lump, egg, and slack. In 1919 the life of the mine was estimated at 15 years.

St. Charles. Puckett Creek Coal Co. No. 1 Mine

Analysis 75788 (p. 15). Bituminous coal, Southwest Virginia fields, from Puckett Creek Coal Co. No. 1 mine, a drift mine 1,620 feet above sea level, 2½ miles south of St. Charles on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Harlan; Pennsylvanian series, Wise formation; thickness, 4 feet 9½ inches; dip, 1½°; strike, N. 60° E. Roof, good shale; floor, hard, smooth shale. The bed was sampled at one point by Albert W. Giles of the Virginia Geological Survey, August 24, 1920, as described below.

Section of coal bed in Puckett Creek Coal Co. No. 1 mine

Laboratory No.	75788	
	Ft.	in.
Roof, shale.		
Coal		*3
Coal	1	6
Pyritic shale		*4
Coal		7½
"Rash"		⅛
Coal	1	4
Pyritic shale		¼
Coal		1½
Pyritic shale		*1
Coal		4
"Rash"		⅛
Coal		2
Floor, shale.		
Thickness of bed	4	9½
Thickness of sample	4	1½

* Not included in sample.

Sample 75788 was taken at heading of main entry, 400 feet southwest of drift mouth. System of mining, room and pillar. Coal was shot down with black blasting powder. All coal was run of mine and came from advance workings; it was picked on car and bin. In 1919 the life of the mine was estimated at 5 years.

St. Charles. Virginia Iron, Coal & Coke No. 2 and 3 Mines

Analyses 75806 to 75808 (p. 15). Bituminous coal, Southwest Virginia fields, from Virginia Iron, Coal & Coke Co. No. 2 and 3 mines, drift mines 2,170 feet above sea level, 3 miles northeast of St. Charles on the Louisville & Nashville Railroad and Southern Railway. Coal bed, Low Splint; Pennsylvanian series, Wise formation; dip, 1°. Roof, good shale; floor, hard, rough shale. Cover at points of sampling, 250 to 500 feet. The bed was measured and sampled at two points by Albert W. Giles, of the Virginia Geological Survey, August 28, 1920, as described below.

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Section of coal bed in Virginia Iron, Coal & Coke Co. No. 2 and 3 mines

Section Laboratory No.	A 75806	B 75807
Roof, shale.	*Ft. in.*	*Ft. in.*
Shaly coal	2	1
Coal	1 6	6
Shale	•3	
Clay		•½
Coal	8	5
Hard pyritic shale	•2	
Clay		•½
Coal	1 6	1 4
Hard carbonaceous shale	•3	
"Rash"		•1
Coal	•1	8
Draw "slate"	•2	
"Rash"		•1
Coal		3
Pyritic shale		•½
Coal		1 4
Bone coal		•2
Floor, shale.		
Thickness of bed	4 9	5 ½
Thickness of sample	3 10	4 7

• Not included in sample.

Section A (sample 75806) was cut in heading of main entry, No. 3 mine, 1,200 feet northwest of drift mouth; section B (sample 75807) was cut in heading of main entry, 1 mile north-northwest of drift mouth, No. 2 mine. The ultimate analysis of a composite sample made by combining face samples 75806 and 75807 is given under laboratory No. 75808.

System of mining, room and pillar. The coal was undercut by machine and shot down with black blasting powder and dynamite. The coal was screened with shaker screens and picked on car. Practically all the coal came from advance workings. Sizes produced, lump and steam. In 1919 the life of the mine was estimated at 50 years.

St. Charles. Benedict No. 1 Mine

Analyses 75789 to 75791 (p. 15). Bituminous coal, Southwest Virginia fields, from No. 1 mine, Benedict Coal Corporation, a drift mine 2,400 feet above sea level, 4½ miles north-northeast of St. Charles on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Phillips; Pennsylvanian series, Wise formation; thickness, 5 feet ½ inch to 5 feet 1 inch; dip, 1⅙°; strike, east of northeast. Roof, good shale; floor, hard smooth shale. Cover at point of sampling, 600 feet. The bed was measured and sampled at two points by Albert W. Giles, of the Virginia Geological Survey, August 26, 1920, as described below.

Sections of coal bed in Benedict No. 1 mine

Section Laboratory No.	A 75789	B 75790
Roof, shale.	*Ft. in.*	*Ft. in.*
Coal	1 5	
Bone coal		2
Fire clay	•4	
Coal		1 1
Carbonaceous shale	•3	
Fire clay		•5
Coal	2	
Carbonaceous shale		•3
Pyritic shale	¼	
Coal	4	2
Pyritic shale	¼	•1
Coal	8	2 9
Draw "slate"		•2
Floor, shale.		
Thickness of bed	5 ¼	5 1
Thickness of sample	4 5½	4 2

• Not included in sample.

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Section A (sample 75789) was taken in heading of main entry, 2,500 feet east-northeast of drift mouth; section B (sample 75790) was taken at heading of 1 left entry off main entry, 2,000 feet north-northwest of drift mouth. The ultimate analysis of a composite sample made by combining face samples 75789 and 75890 is given under laboratory No. 75791.

System of mining, room and pillar. Coal is undercut by machines. At the time of sampling the daily output was 450 tons. Coal was screened and picked on car; all coal was run of mine and derived from advance workings. In 1919 the life of the mine was estimated at 50 years.

PULASKI COUNTY

Pulaski. Virginia Anthracite Coal Corporation No. 1 Mine

Analyses 75888 to 75890 (p. 17). Bituminous coal, Valley coal fields, from Virginia Anthracite Coal Corporation No. 1 mine, a slope mine about 2,500 feet above sea level, 8 miles north of Pulaski, connected with the Norfolk & Western by tram road. Coal bed, Little; Mississippian series, Price formation; thickness, 4 feet 5 inches to 5 feet 1 inch; dip, 35° south. Roof, hard shale; floor, hard and smooth. Bed was measured and sampled at two points by M. R. Campbell, of the United States Geological Survey, September 4, 1920, as described below.

Section A (75888), representing 5 feet 1 inch of coal, was cut at face of 2 west entry, 500 feet from slope and 300 feet on the dip from the mouth; section B (75889), representing 4 feet 5 inches of coal, was cut at face of 2 east entry, 600 feet from slope and 250 feet on the dip from slope mouth. The ultimate analysis of a composite sample, made by combining face samples 75888 and 75889 is given under laboratory No. 75890.

System of mining, hand. In 1919 the daily output of the mine was 150 tons.

RUSSELL COUNTY

Dante. Clinchfield No. 3 Mine

Analyses 32326 to 32328 (p. 17). Bituminous coal, Southwest Virginia fields, from Clinchfield No. 3 mine, a drift mine at Dante, on the Carolina, Clinchfield & Ohio Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 4 feet 9 inches to 5 feet 5½ inches. Roof, shale with sandstone above; floor, clay. Cover at point of sampling, 200 feet or more. The bed was sampled at two points by C. K. Wentworth of the United States Geological Survey, July 7, 1919, as described below.

Sections of coal bed in Clinchfield No. 3 mine

Section	A		B	
Laboratory No.	32326		32327	
Roof, shale with sandstone above.	*Ft.*	*in.*	*Ft.*	*in.*
Coal		3		1
Bone		*2		*1
Coal	1	4	1	2
Sandstone		*1½		*1½
Coal	1	5	1	4
Shale		*1		*1½
Coal	2	1	1	10
Floor, clay.				
Thickness of bed	5	5½	4	9
Thickness of sample	5	1	4	5

*Excluded from sample.

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These sections were measured 4,000 feet east of opening. The ultimate analysis of a composite sample made by combining face samples 32326 and 32327 is given under laboratory No. 32328.

Coal is undercut by four shortwall machines; shaker screens are used and coal is picked on tables. At the time of sampling the daily capacity was 700 tons.

Dante. Prospect Opening

Analysis 32454 (p. 18). Bituminous coal, Southwest Virginia fields, from a prospect opening at Dante, 10 feet from the Carolina, Clinchfield & Ohio Railroad. Coal bed, Kelly; Pennsylvanian series, Wise formation; thickness, 1 foot 9 inches. Roof, sandstone; floor, clay. The bed was sampled at one point by C. K. Wentworth, of the United States Geological Survey, July 5, 1919, as described below.

Section of coal bed in prospect opening

Laboratory No.	32454	
	Ft.	*in.*
Roof, sandstone.		
Carbonaceous shale		[a]6
Coal	1	2
Bone		[a]1
Floor, clay.		
Thickness of bed	1	9
Thickness of sample	1	2

[a] Excluded from sample.

Dante. Laurel Branch Mine

Analyses 32452 and 32453 (p. 18). Bituminous coal, Southwest Virginia fields, from Laurel Branch Coal Co. mine, one-half mile west of Dante on the Carolina, Clinchfield & Ohio Railroad. Coal bed, Kennedy; Pennsylvanian series, Norton formation; thickness, 5 feet 4 inches to 6 feet. Roof, sandstone; floor, clay. The bed was sampled at two points, having 30 to 100 feet of cover, by C. K. Wentworth of the United States Geological Survey, July 5, 1919. Sample 32452 was taken 50 feet southwest of opening, and sample 32453 was taken 150 feet northwest of opening.

St. Paul. Russell Fork Mine

Analyses 32513 (p. 19). Bituminous coal, Southwest Virginia fields, from Russell Fork mine, a drift mine at St. Paul on the Norfolk & Western and Carolina, Clinchfield & Ohio Railroads. Coal bed, undetermined; Pottsville group; thickness, 4 feet 2 inches. Roof, sandstone; floor, sandstone. Cover at point of sampling, about 60 feet. The bed was sampled at one point by Albert W. Giles, of the Virginia Geological Survey, July 30, 1919, as described below.

Section of coal bed in Russell Fork mine

Section	A	
Laboratory No.	32513	
	Ft.	*in.*
Roof, sandstone.		
Carbonaceous shale		[a]1
Coal	2	11
Clay, with coal partings	[a]1	2
Floor, sandstone.		
Thickness of bed	4	2
Thickness of sample	2	11

[a] Excluded from sample.

This sample was measured 150 feet west of drift mouth.

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SCOTT COUNTY

DUNGANNON. J. S. T. COAL CORPORATION MINE

Analyses 75743 to 75745 (p. 20). Bituminous coal, Southwest Virginia fields, from mine of J. S. T. Coal Corporation, a drift mine 1,680 feet above sea level, 3 miles northeast of Dungannon, connected by tram with the Carolina, Clinchfield & Ohio Railroad. Coal bed, Burton's Ford; Pennsylvanian series, Lee formation; thickness, 5 feet 7 inches to 6 feet 7 inches; dip, 38° northeast. Roof, sandstone; floor, hard clay. Cover at point of sampling, 100 feet. The bed was measured and sampled at two points by J. Brian Eby, of the United States Geological Survey, August 18, 1920, as described below.

Sections of coal bed in J. S. T. Corporation mine

Section	A		B	
Laboratory No.	75743		75744	
Roof, sandstone.	*Ft.*	*in.*	*Ft.*	*in.*
Coal	2	8	4	7
Clay		*1		*6
Coal	2	8		6
Clay		*9	----	----
Coal		5	----	----
Floor, hard clay.				
Thickness of bed	6	7	5	7
Thickness of sample	5	4	5	1

* Not included in sample.

Section A (sample 75743) was cut off mining face of 13 room 1,000 feet east of drift, then 110 feet from main entry. Section B (sample 75744) was cut at main heading 1,800 feet east of drift off beginning of room 17. The ultimate analysis of a composite sample, made by combining face samples 75743 and 75744, is given under laboratory No. 75745.

System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder; all coal was run of mine and picked on car. In 1920 the daily output of the mine was 75 tons.

WISE COUNTY

ARNO. STONEGA NO. 2 MINE

Analyses 75964 to 75967 (pp. 24-25). Bituminous coal, Southwest Virginia fields, from Stonega No. 2 mine, Stonega Coal & Coke Co., a drift mine 1,900 feet above sea level, at Arno on the Interstate Railroad. Coal bed, Imboden; Pennsylvanian series, Wise formation; thickness, 6 feet 10 inches to 9 feet 8 inches; dip, horizontal. Roof, slate; floor, hard clay. Cover at points of sampling, 300 feet. The bed was measured and sampled at three points by J. Brian Eby, of the United States Geological Survey, September 7, 1920, as described below.

Sections of coal bed in Stonega No. 2 mine

Section	A		B		C	
Laboratory No.	75964		75965		75966	
Roof, "slate."	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	2	4	4	2	3	5
"Curly" coal	5		----	----	----	----
"Rash"	----	----		2		2
Coal	2	4		6	1	7
"Sulphur" streaks	----	----		½		1
Coal	----	----	2	2	1	7
Floor, hard clay						
Thickness of bed	9	8	7	½	6	10
Thickness of sample	9	8	7	½	6	10

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Section A (sample 75964) was cut at 7 room off 5 face entry, 1 butt right entry, 2,500 feet north of drift; section B (sample 75965) was cut at 14 room off 1 butt right off 5 face entry, 3,000 feet northeast of drift; section C (sample 75966) was cut in pillar between 30 and 31 rooms 2 left face entry, 2 right butt entry, 3,000 feet north of drift. The ultimate analysis of a composite sample made by combining face samples 75964 to 75966 inclusive is given under laboratory No. 75967.

System of mining, room and pillar. In 1919 the coal was undercut by machines and shot down with black blasting powder; all coal was run of mine and picked on car; all sizes produced at the time of sampling. The daily output of the mine was 1,200 tons. The 1919 output was estimated to be 320,000 tons. In 1919 the life of the mine was estimated at 30 years.

Banner. Lower Banner No. 1 Mine

Analyses 32509 to 32512 (p. 25). Bituminous coal, Southwest Virginia fields, from Lower Banner No. 1 mine, a drift mine at Banner on the Norfolk & Western R. R. Coal bed, Lower Banner; Pennsylvanian series, Norton formation; thickness, 2 feet 6 inches to 4 feet 4 inches. Cover at points of sampling, 75 to 350 feet. The bed was sampled at three points by Albert W. Giles, of the Virginia Geological Survey, July 29, 1919, as described below.

Sections of coal bed in Lower Banner No. 1 mine

Section	A		B		C	
Laboratory No.	32509		32510		32512	
Roof, shale, and sandstone.	*Ft.*	*In.*	*Ft.*	*In.*	*Ft.*	*In.*
Coal	2	6	2	3		
Carbonaceous shale						•1
Clay				•1½		
Bone						•7
Coal				6		
Shale						•2
Coal					1	10
Sandstone						•1
Coal					1	3
Carbonaceous shale						•2
Coal						•2
Floor, shale.						
Thickness of bed	2	6	2	10½	4	4
Thickness of sample	2	6	2	9	3	1

• Excluded from sample.

Section A was measured 700 feet west of drift mouth; section B was measured 600 feet west of drift mouth; and section C was measured 4,300 feet west of drift. The ultimate analysis of a composite sample made by combining face samples 32509 and 32510 is given under laboratory No. 32511.

The daily capacity at the time of sampling was 35 to 250 tons.

Dooley. Outcrop Exposure, Not Worked

Analysis 75968 (p. 25). Bituminous coal, Southwest Virginia fields, from outcrop exposure (not worked), 2,350 feet above sea level, three-fourths mile southwest of Dooley. Coal bed, unnamed; Pennsylvanian series, Lee formation; thickness of bed, coal, and sample, 2 feet 3 inches; dip, vertical; strike, E. 5° N. The bed was measured and sampled at one point by J. Brian Eby, of the United States Geological Survey, September 8, 1920.

This sample was taken on outcrop (pit only 3 feet deep).

This is the lowest coal bed in the geological column of Wise County.

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Dorchester. Haskell No. 3 Mine

Analyses 75440 to 75442 (p. 25). Bituminous coal, Southwest Virginia fields, from Haskell No. 3 mine, Wise Coal & Coke Co., a drift mine at Dorchester on the Interstate Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; dip, 5° average; strike, southeast. Roof, sandstone; floor, soft clay. Cover at points of sampling, 150 feet. The bed was measured and sampled at two points by J. Brian Eby, of the United States Geological Survey, August 3, 1920, as described below.

Sections of coal bed in Haskell No. 3 mine, Wise Coal & Coke Co.

Section	A		B	
Laboratory No.	75440		75441	
	Ft.	*in.*	*Ft.*	*in*
Roof, sandstone.				
Coal	1	9	1	8
Clay and dirty coal		•6		•6
Coal	2	2	2	
Bone		•½		•¼
Coal		6		6
Floor, soft clay.				
Thickness of bed	4	11½	4	8¼
Thickness of sample	4	5	4	2

• Not included in sample.

Section A (sample 75440) was cut off face of C heading, 1 main entry, 1½ miles northwest of drift mouth; section B (sample 75441) was cut at face of C heading of 2 main entry, 1½ miles west-northwest of drift mouth. The ultimate analysis of a composite sample made by combining face samples 75440 and 75441 is given under laboratory No. 75442.

System of mining, room and pillar. Coal was undercut by machines and shot down with permissible explosive. At the time of sampling the daily output was 500 tons. All sizes were produced; 90 per cent of coal was coked. The coal bed rolls and the thickness varies. In 1919 the life of the mine was estimated at 40 years.

Dunbar. Roda Mine

Analysis 32962 (p. 25). Bituminous coal, Southwest Virginia fields, from Dunbar mine, a drift mine at Dunbar on the Roaring Fork Railroad. Coal bed, Taggart marker; Pennsylvanian series, Wise formation; thickness, 3 feet 8 inches. Roof, shale; floor, shale. Cover at point of sampling, 100 feet. The bed was sampled at one point by C. K. Wentworth, of the United States Geological Survey, September 25, 1919, as described below.

Section of coal bed in Roda mine

Laboratory No.	32962	
	Ft.	*In.*
Roof, shale.		
Bony coal	3	6
Bone		•1
Coal		•1
Floor, shale.		
Thickness of bed	3	8
Thickness of sample	3	6

• Not included in sample

The above sample was measured 200 feet west of opening. At the time of sampling the daily capacity was 75 tons.

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Dunbar. Dunbar Mine

Analysis 32963 (p. 25). Bituminous coal, Southwest Virginia fields, from Dunbar mine, at Dunbar on the Roaring Fork Railroad. Coal bed, Taggart; Pennsylvania series, Wise formation; thickness, 4 feet 7 inches. Roof, shale; floor, shale. Cover at point of sampling, 100 feet. The bed was sampled at this point by C. K. Wentworth, of the United States Geological Survey, September 25, 1919, as described below.

Section of coal bed in Dunbar mine

Laboratory No.	32963	
	Ft.	*in.*
Roof, shale.		
Coal		9
Shale		½
Coal	1	2
Shale		½
Coal		5
Shale		½
Coal	1	2
Carbonaceous shale		½
Coal		11
Floor, shale.		
Thickness of bed	4	7
Thickness of sample	4	7

This sample was measured 200 feet west of opening.

The daily capacity was 225 tons.

Esserville. J. A. Esser Mine No. 4

Analyses 75359 to 75362 (p. 25). Bituminous coal, Southwest Virginia fields, from No. 4 mine, J. A. Esser Coke Co., a drift mine 2,250 feet above sea level, three-fourths mile north-northeast of Esserville on the Interstate Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 3 feet 2 inches to 3 feet 7 inches; dip, horizontal. Roof, shale; floor, hard clay. Cover at point of sampling, 100 to 150 feet. The bed was measured and sampled at three points by J. Brian Eby, of the United States Geological Survey, July 23, 1920, as described below.

Sections of coal bed in J. A. Esser mine No. 4

Section	A		B		C	
Laboratory No.	75359		75360		75361	
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Roof, shale.						
Bone		1				
Draw "slate"				*3		*2½
Coal	1	1			3	4
Bone ("mother" coal)		1		2		
Coal	1	11	3	2		
Floor, hard clay.						
Thickness of bed	3	2	3	7	3	6½
Thickness of sample	3	2	3	4	3	4

* Not included in sample.

Section A (sample 75359) was cut at face of 2 room, 2 left entry, 2,500 feet north; section B (sample 75360) was cut at face of heading of 5 right entry, 3,000 feet north; section C (sample 75361) was cut at face of 5 room of 4 right entry, 3,000 feet north. The ultimate analysis of a composite sample made by combining face samples 75359 to 75361 is given under laboratory No. 75362.

System of mining, room and pillar. Coal was undercut by machines, coal being shot down with dynamite; all sizes were produced and coked. Coal was

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run of mine. At the time of sampling the daily output was 75 tons. In 1919 the life of the mine was estimated at 10 years.

Glamorgan. Glamorgan No. 3 Mine

Analyses 32842 to 32844 (pp. 25–26). Bituminous coal, Southwest Virginia fields, from Glamorgan No. 3 mine, Stone Gap Coal Co., a drift mine at Glamorgan, on the Interstate Railroad. Coal bed, Dorchester; Pennsylvanian series, Wise formation; thickness, 4 feet 7¾ inches to 5 feet 6 inches. Roof and floor, "slate." Cover at points of sampling, 200 feet. The bed was sampled at two points by C. K. Wentworth, of the United States Geological Survey, September 1, 1919, as described below.

Sections of coal bed in Glamorgan No. 3 mine

Section	A		B	
Laboratory No.	32842		32843	
Roof, "slate."	*Ft.*	*in.*	*Ft.*	*in.*
Coal		3½		
Draw "slate"				• 10
Shale		¼		
Coal	1	3		8
Shale		¼		¼
Coal		4		3
Shale		• ½		¼
Coal		• 1		6
Shale		• 1		¼
Coal		6		4
Shale		¼		• ½
Coal				• 1
Shale				• 1
Coal, hard	1	4	1	9
Bone		• 1		• 1½
Coal		7		9
Floor, "slate."				
Thickness of bed	4	7¾	5	5¾
Thickness of sample	4	4¼	4	3¾

• Excluded from sample.

These samples were measured 1½ miles northeast of opening.
At time of sampling the daily capacity was 500 tons.

Imboden. Imboden No. 2 Mine

Analyses 75972 to 75975 (p. 26). Bituminous coal, Southwest Virginia fields, from Imboden No. 2 or Hale mine, Stonega Coal & Coke Co., a drift mine 1,900 feet above sea level, at Imboden on the Southern Railway. Coal bed, Imboden; Pennsylvanian series, Wise formation; thickness, 5 feet 3 inches to 5 feet 8 inches; dip, level. Roof, section A, good sandstone; section B, solid sandy shale; section C, sandstone to sandy shale. Floor, hard clay. Cover at points of sampling, 200 feet. The bed was measured and sampled at three points by J. Brian Eby of the United States Geological Survey, September 9, 1920, as described below.

Sections of coal bed in Imboden No. 2 mine

Section	A		B		C	
Laboratory No.	75972		75973		75974	
Roof, sandy shale and sandstone.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	2	10	1	11	2	11
Clay and "rash"		• 3		• 6		• 4
Coal	2	2	3	3	2	2
Floor, hard clay.						
Thickness of bed	5	3	5	8	5	5
Thickness of sample	5		5	2	5	1

• Not included in sample.

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Section A (sample 75972) was taken at fresh cut manhole on left wall of main line midway between 7 and 8 left entries, 2,000 feet in; section B (sample 75973) was taken at face of main heading, 8 left entry, 3,500 feet northwest of drift; section C (sample 75974) was taken from pillar between 18 and 19 rooms on 6 right entry off of main entry. The ultimate analysis of a composite sample made by combining face samples 75972 to 75974 is given under laboratory No. 75975.

System of mining, room and pillar. Coal was undercut by machines and shot down with black blasting powder and permissible explosive. At the time of sampling the daily output was 1,200 tons; the output in 1919 was 290,400 tons. All coal was run of mine, and screened with 2½-inch screens. In 1919 the life of the mine was estimated at 40 years.

Inman. Virginia Iron, Coal & Coke Co. No. 2 Mine

Analyses 75969 to 75971 (p. 26). Bituminous coal, Southwest Virginia fields, from the Virginia Iron, Coal & Coke Co. No. 2 mine, a drift mine one-half mile north of Inman, on the Southern Railway. Coal bed, Kelly-Imboden; Pennsylvania series, Wise formation; thickness, 8 feet to 10 feet 3 inches; dip, horizontal. The bed was measured and sampled at two points by J. Brian Eby for the United States Geological Survey, September 11, 1920, as described below.

Sections of coal bed in Virginia Iron, Coal & Coke Co. No. 2 mine

Section	A		B	
Laboratory No.	75969		75970	
	Ft.	*in.*	*Ft.*	*in.*
Coal	5		1	
"Rash" and dirty coal		*6		
Shale				*4
Coal	2	6	2	7
"Rash"				*2
Coal ("curly")			3	6
Shale				2
Coal			2	6
Thickness of bed	8		10	3
Thickness of sample	7	6	9	9

*Not included in sample.

Section A (sample 75969) was cut off pillar at old heading of old 2 main-line aircourse, 3,600 feet northwest of drift mouth; section B (sample 75970) was cut off face of 3 right heading, 2,300 feet northwest of drift mouth. The ultimate analysis of a composite sample made by combining face samples 75969 and 75970 is given under laboratory No. 75971.

System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. Coal was run of mine, all sizes produced and picked on car. At the time of sampling the daily output was 500 tons. In 1919 the life of the mine was estimated at 4 years.

The top bench of 4½ feet was not mined, due to bad roof. This mine was said to be one of the oldest in Wise County; it has been in operation over 35 years.

Norton. Norton No. 2 Mine

Analyses 75363 to 75366 (pp. 26–27). Bituminous coal, Southwest Virginia fields, Norton district, from No. 2 mine of Norton Coal Co., a drift mine 2,150 feet above sea level, one-half mile northeast of Norton, on the Norfolk & Western Railroad and Louisville & Nashville Railroad. Coal bed, Norton; Pennsylvanian series, Norton formation; thickness, 4 feet 4½ inches to 6 feet 8¼ inches; dip,

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practically horizontal. The bed was measured and sampled at three points by J. Brian Eby for the United States Geological Survey, July 19, 1920, as described below.

Sections of coal bed in Norton No. 2 mine

Section Laboratory No	A 75363	B 75364	C 75365
	Ft *in.*	*Ft.* *in.*	*Ft.* *in*
Coal	2 9	2 9	2 2
Shale	•4	•11	
"Sulphur" streaks			¼
Coal	•½	•½	1 1
Shale	•7	•1	•11
Coal	•1	2	•2
Shale	•2	•2	•3
Coal	2 5	2 4	1 5
Coal with "rash"			8
Thickness of bed	6 4½	6 5½	6 8¼
Thickness of sample	5 2	5 3	5 4¼

• Not included in sample.

Section A (sample 75363) was cut at face of 1 room off 5 right entry, 2,000 feet north; section B (sample 75364) was cut 100 feet from head of 3 left entry, 2,000 feet north; section C (sample 75365) was cut at face of 1 room off 4 left entry, 1,500 feet north. The ultimate analysis of a composite sample made by combining face samples 75363 to 75365 is given under laboratory No. 75366.

System of mining, room and pillar. Coal is undercut by machine and shot down with 30 per cent dynamite. Sizes produced, 6, 4, and 2 inch; screened with shaker screens. At the time of sampling the daily output was 250 tons. In 1919 the output was 50,000 tons. In 1920 the life of the mine was estimated to be 20 years.

Osaka. Osaka Mine

Analyses 33182 to 33185 (p. 27). Bituminous coal, Southwest Virginia fields, from Osaka mine, Stonega Coke & Coal Co., a drift mine at Osaka on the Interstate Railroad. Coal bed, Imboden, Pennsylvania series, Wise formation; thickness, 4 feet to 5 feet 9 inches. Roof, "slate"; floor, clay. Cover at points of sampling, 400 feet. The bed was sampled at three points by C. K Wentworth of the United States Geological Survey, November 14, 1919, as described below.

Sections of coal bed in Osaka mine

Section Laboratory No	A 33182	B 33183	C 33184
	Ft. *in.*	*Ft.* *in.*	*Ft.* *in.*
Roof, "slate."			
Coal	1 2	3	1 10
Shale	¼	¼	•1
Coal	6	3	8
Shale	¼	¼	
Dirty coal	6		5
Coal		7	
Shale	•½	¼	•1
Coal	1 9	7	4
Mud		•1	
Coal		4	
Curly coal		7	
Coal and laminated shale		8	
Shale		•2	•1
Coal		1 6	2 3
Thickness of bed	4	5 ¾	5 0
Thickness of sample	3 11½	4 9¾	5 6

• Excluded from sample.

The samples were measured 1½ miles northeast of opening.

At the time of sampling the daily capacity was 1,000 tons.

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Pardee. Pardee No. 1 Mine

Analyses 33140 to 33142 (p. 27). Bituminous coal, Southwest Virginia fields, from Pardee No. 1 mine, Blackwood Coal & Coke Co., a drift mine at Pardee, on the Roaring Fork Railroad. Coal bed, Pardee; Pennsylvanian series, Wise formation; thickness, 12 feet 4 inches. Roof, "slate"; floor, clay. Cover at points of sampling 500 feet. The bed was sampled at two points by C. K. Wentworth, of the United States Geological Survey, November 7, 1919, as described below.

Sections of coal bed in Pardee No. 1 mine

Section	A		B	
Laboratory No.	33140		33141	
	Ft.	in.	Ft.	in.
Roof, "slate."				
Coal		1		2
Shale		¼		1
Coal		4		4
Shale		[a] 2		[a] 2
Coal		5		8
Shale		[a] 2		[a] ½
Coal	1	6		10
"Slate"				[a] ½
Bone		½	1	
Shale				
Coal	1	9	1	2
Bone				
Shale		[a] 1		[a] ½
Coal	2	6	2	6
"Rash"		2		1
Coal	1	4	1	2
"Rash"		2		2
Coal	1	4	1	10
Floor, clay.				
Thickness of bed	10	¾	10	3½
Thickness of sample	9	7¾	10	

[a] Excluded from sample.

Section A was measured 1 mile northwest of opening and section B ½ mile east. The ultimate analysis of a composite sample made by combining face samples 33140 and 33141 is given under laboratory No. 33142.

At the time of sampling the daily capacity was 500 tons.

Pardee. Pardee No. 1 Mine

Analyses 84357 to 84363 (p. 27). Bituminous coal, Southwest Virginia fields, from Pardee No. 1 mine, a drift mine at Pardee on the Interstate and Louisville & Nashville Railroads. Coal bed, Pardee; Pennsylvanian series, Wise formation; thickness, 7 feet 1¾ inches to 10 feet 4 inches; dip, slight; strike, northwest. Roof, coal and shale; floor, hard and smooth. Cover at points of sampling, 75 to 450 feet. The bed was sampled at six points by J. Brian Eby, of the United States Geological Survey, February 17, 1922, as described on page 54.

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Sections of coal bed in Pardee No. 1 mine

Section Laboratory No.	A 84357	B 84358	C 84359	D 84360	E 84361	F 84362
	Ft. in.	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Roof, coal and shale.						
Coal, soft	6	•4	4	1 2	•1 2	•1
Clay	•2					
Shale		•6	•3	•1½	•1¼	•1¼
Coal, soft	1 5	•4	3 8	1 11	1 9	1 6
"Rash"	1	•1				
Shale		•2				
Shale and "rash"					•4	
Shale, "rash," "sulphur"				•½		•1½
Coal	2 5	•1 10	5 3	2 5	2 2	3 8
Shale	•1			•4	•¼	
Coal		1 8		2 11	1 2	
"Rash"						•1
Coal, bony					1½	
Clay and "rash"		•5				
Coal		3 4			1 8	1 9
"Rash"		1				
Coal	5 8	1 7				
Floor, hard, smooth clay.						
Thickness of bed	10 4	10 3	9 7	8 11	8 5¼	8 1¾
Thickness of sample	10 1	6 8	9 3	8 5	6 10½	6 11

• Excluded from sample.

Section A was measured at 2 right entry off 3 face entry, on pillar opposite 15 room; section B was measured at face of room 6 in Goda heading; section C was measured at 11 room, 6 right entry off 3 face entry; section D was measured at 8 room, 9 right entry off 3 face entry; section E was measured at 4 face heading, 250 feet from first radius; section F was measured off pillar, 300 feet from haulway to 1 right off angle heading. The ultimate analysis of a composite sample made by combining face samples 84357 to 84362 is given under laboratory No. 84363.

At the time of sampling the daily capacity was 700 tons. In 1921, the year's output was 218,700 tons.

Pardee. Pardee No. 4 Mine

Analyses 84364 to 84366 (p. 27). Bituminous coal, Southwest Virginia fields, from Pardee No. 4 mine, a drift mine, at Pardee on the Interstate Railroad. Coal bed, Pardee; Pennsylvanian series, Wise formation; thickness, 10 feet 2 inches to 10 feet 6½ inches. Roof, coal; floor, hard, smooth clay. Cover at points of sampling, 200 to 300 feet. The bed was sampled at two points by J. Brian Eby, of the United States Geological Survey, February 18, 1922, as described below.

Sections of coal bed in Pardee No. 4 mine

Section Laboratory No.	A 84364	B 84365
	Ft. in.	*Ft. in.*
Roof, coal.		
Coal	•3	8
Carbonaceous shale		•2
Coal	1 4	4 2
Shale and "sulphur"	•1	
Coal	4	
Shale	•1½	•1
Coal	2 1	3 9½
"Rash"		•1
Coal		1 3
Floor, hard, smooth clay.		
Thickness of bed	10 6½	10 2½
Thickness of sample	7 5	9 10½

• Excluded from sample.

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Section A was measured at 11 room, 3 left butt off of right entry; and section B at 10 room, off main entry. The ultimate analysis of a composite sample made by combining face samples 84364 and 84365, is given under laboratory No. 84366.

The production for this mine is included in the production given for the second description of mine No. 1.

Roaring Fork. Roaring Fork Mine

Analyses 33143 to 33145 (p. 28). Bituminous coal, Southwest Virginia fields, from Roaring Fork mine, a drift-mine at Roaring Fork on the Roaring Fork Railroad. Coal bed, Kelly; Pennsylvanian series, Wise formation; thickness 5 feet 7½ inches. Roof, slate; floor, clay. The bed was sampled at two points by C. K. Wentworth, of the United States Geological Survey, November 7, 1919, as described below.

Sections of coal bed in Roaring Fork mine

Section	A		B	
Laboratory No.	33143		33144	
	Ft.	in.	Ft.	in.
Roof, slate.				
Coal		3		3
Shale		¼		¼
Coal		7		4
Bone		*1		
Shale				¼
Coal		3		9
Bone				1
Shale		*3		
"Slate"				*4
Bony coal		2		
Coal		7		1
Bony coal		2		1
Coal	2	4	3	2
Coal		*5		
"Slate"		*2		*2
"Rash"				*4
Coal		*4		
Thickness of bed	5	7¼	5	7½
Thickness of sample	4	4¼	4	9½

* Excluded from sample.

Sections A and B were measured one-half mile east of opening. The ultimate analysis of a composite sample, made by combining face samples 33143 and 33144, is given under laboratory No. 33145.

At the time of sampling, the daily capacity was 400 tons.

Roda. Roda No. 3 Mine

Analyses 33203 to 33207 (p. 28). Bituminous coal, Southwest Virginia fields, from Roda mine, a drift mine at Roda on the Interstate Railroad. Coal bed, Taggart; Pennsylvanian series, Wise formation; thickness, 5 feet 4¼ inches to 6 feet 6¾ inches. Roof, "slate"; floor, clay. Cover at points of sampling, 300 feet. The bed was sampled at four points by C. K. Wentworth, of the United States Geological Survey, November 15, 1919, as described below.

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Sections of coal bed in Roda No. 3 mine

Section Laboratory No.	A 33203	B 33204	C 33205	D 33206
Roof, "slate."	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	2	2	2	2
Bone	1/2	1/2	1/2	1/2
Coal	4	4	4	6
Shale	1/4	1/4	1/4	[a] 1/2
Coal	10	1	7	7
Bony coal	5	4	4	5
Coal	2 4	2 1	2 10	2
"Slate"	[a] 1			
Shale		1/4	1/2	[a] 1/2
Coal	2 4	2 4	1	1 8
Shale				1/4
Coal				1
Floor, clay.				
Thickness of bed	6 6 3/4	6 4	5 4 1/4	5 5 3/4
Thickness of sample	6 5 3/4	6 4	5 4 1/4	5 4 3/4

[a] Excluded from sample.

The foregoing samples were measured one-half mile north of opening. At the time of sampling the daily capacity was 1,800 tons.

Stonega. Stonega Nos. 2 and 3 Mines

Analyses 33186 to 33189 (p. 28). Bituminous coal, Southwest Virginia fields, from Nos. 2 and 3 mines, drift mines at Stonega on the Interstate Railroad. Coal bed, Imboden; Pennsylvanian series, Wise formation; thickness, 6 feet 3½ inches to 7 feet 3½ inches. Roof, "slate" and sandstone; floor, clay and "slate." Cover at points of sampling, 400 to 1,000 feet. The bed was measured at three points by C. K. Wentworth, of the United States Geological Survey, November 13, 1919, as described below.

Sections of coal bed in Stonega Nos. 2 and 3 mines

Section Laboratory No.	A 33186	B 33187	C 33188
Roof, "slate" and sandstone.	Ft. in.	Ft. in.	Ft. in.
Bone "slate"		[a] 4	
Coal	1 6	2 0	2 9
Shale		[a] 1	[a] 1
Coal	7	5	9
Clay and shale	[a] 5		
Shale		1/2	[a] 1 1/2
Coal		8	2 7
Dirty coal	[a] 2 10	3	
"Slate"		1	
Dirty curly coal		3	
Coal	1 8	2 4	
Floor, clay.			
Thickness of bed	7 0	6 5 1/2	6 3 1/2
Thickness of sample	3 9	6 1/2	6 1

[a] Excluded from sample

The foregoing samples were measured 1 mile southeast of opening. Samples 33186 and 33187 were taken at Stonega No. 3 mine, and sample 33188 at Stonega No. 2 mine.

At the time of sampling the daily capacity of Stonega No. 3 mine was 800 tons and of Stonega No. 2 mine 300 tons.

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St. Paul. Twin City Nos. 1, 2, and 3 Mines

Analyses 32275 to 32277 (p. 28). Bituminous coal, Southwest Virginia fields, from Nos. 1, 2, and 3 mines, drift mines at St. Paul on the Norfolk & Western, and Carolina, Clinchfield & Ohio Railroads. Coal bed, No. 1 mine, Raven (Wise formation); and Nos. 2 and 3, Jawbone (Norton formation); Pennsylvanian series; thickness, 3 to 20 feet. Roof, shale and sandstone; floor, shale. The beds were measured by Albert W. Giles, of the Virginia Geological Survey, July 1, 1919, as described below.

Sections of coal beds in Twin City Nos. 1, 2, and 3 mines

Section	A	B	C
Laboratory No.	32275	32276	32277
Roof, shale and sandstone.			
Coal	Ft. 1 in. 2	Ft. [a]1 in. 0	Feet 6 to 20
Carbonaceous shale	[a]1		
Coal	1 10	11 6	
		[a]6 0	
Floor, shale.			
Thickness of bed	3 1	18 6	6 to 20
Thickness of sample	3 0	11 6	6 to 20

[a] Excluded from sample.

Section A was measured in mine No. 1, Raven bed, one-fourth mile northeast of entrance, sample taken at main heading; section B was measured in mine No. 2, Jawbone bed, 300 feet N. 20° E. of main heading; and section C was measured in mine No. 3, Jawbone bed, one-half mile N. 20° E. of main heading.

At the time of sampling the daily capacity of No. 1 mine was 15 tons, of No. 2 mine 25 tons, and of No. 3 mine 12 tons.

Sutherland. Clark No. 2 Mine

Analyses 75436 to 75439 (pp. 28 and 29). Bituminous coal, Southwest Virginia fields, from Clark No. 2 mine, Wise Coal & Coke Co., a drift mine, 1 mile northwest of Sutherland, on a branch of the Interstate Railroad, 2,200 feet above sea level. Coal bed, Dorchester (Haskell No. 3); Pennsylvanian series, Wise formation; thickness, 6 feet 2 inches; dip, 10°; strike, east. Roof, hard shale; floor, clay. The bed was measured and sampled at three points by J. Brian Eby of the United States Geological Survey, July 31, 1920, as described below.

Sections of coal bed in Clark No. 2 mine

Section	A	B	C
Laboratory No.	75436	75437	75438
Roof, hard shale.			
Dirty coal	Ft. in. [a]2		
Coal	1 6	Ft. 1 in. 8	Ft. 1 in. 9
Clay and dirty coal	[a]6	[a]6	[a]1
Coal	2 3	4	2 5
Floor, hard clay.			
Thickness of bed	4 5	6 2	5 2
Thickness of sample	3 9	5 8	4 2

[a] Not included in sample.

Section A (sample 75436) was cut 4,000 feet south of drift mouth, off face at heading of 2 left aircourse of 3 right entry; section B (sample 75437) was cut 5,000 feet southwest of opening off face of monkey heading from main line; section C (sample 75438) was cut 5,000 feet south from drift mouth, off heading of 4 left aircourse, off 3 right entry. The ultimate analysis of a composite sample

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made by combining face samples 75436 to 75438 is given under laboratory No. 75439.

System of mining, room and pillar. Coal was undercut by machines and shot down with dynamite. At the time of sampling the daily output was 400 tons, all sizes being produced. In 1919 the output was 78,000 tons.

Tacoma. Beaver Mine

Analyses 75446 to 75448 (p. 29). Bituminous coal, Southwest Virginia fields, from a drift mine of Beaver Coal Co. 1 mile north of Tacoma, on the Norfolk & Western Railroad. Coal bed, Lower Banner; Pennsylvanian series, Norton formation; thickness, 3 feet 5 inches to 5 feet; dip, 8°; strike, north. Roof, hard shale; floor, hard shale. The bed was measured and sampled at two points by J. Brian Eby of the United States Geological Survey, August 2, 1920, as described below.

Sections of coal bed in Beaver mine

Section Laboratory No.	A 75446		B 75447	
Roof, hard shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal (soft)		5	3	
Coal (very hard)	1	10	1	8
Coal (soft)	1	2		4
Floor, hard shale.				
Thickness of bed	3	5	5	
Thickness of sample	3	5	5	

Section A (sample 75446) was cut off face of heading of main right entry 1,300 feet southeast of drift mouth; section B (sample 75447) was cut at left wall, 20 feet from face of heading of left straight main entry 1,000 feet east of drift. The ultimate analysis of a composite sample made by combining face samples 75446 and 75447 is given under laboratory No. 75448.

System of mining, room and pillar. Coal was undercut by machines, and shot down with black blasting powder. At the time of sampling the daily output was 150 tons, all sizes being produced. The output for 1919 was 28,000 tons. In 1919 the life of the mine was estimated at 40 years.

Tacoma. Bolling Coal Co. Mine.

Analyses 75443 to 75445 (p. 29). Bituminous coal, Southwest Virginia fields, from mine of Bolling Coal Co., a slope mine 2,000 feet above sea level, at Tacoma. Coal bed, Imboden; Pennsylvanian series, Wise formation; thickness, 4 feet to 4 feet 6½ inches; dip, 15°; strike, N. 20° W. Roof, soft shale; floor, hard clay. The bed was measured and sampled at two points by J. Brian Eby for the United States Geological Survey, August 2, 1920, as described below.

Sections of coal bed in Bolling Coal Co. mine

Section Laboratory No.	A 75443		B 75444	
Roof, soft shale.	*Ft.*	*in.*	*Ft.*	*in.*
Coal	1	8		½
"Rash"-coal streaks	• 1			• 1
Clay				
Coal	1	4		
Coal (soft)				2
Coal (hard)			1	9
Clay and "rash"			• 1	2
Coal (hard)			1	4
Floor, hard clay.				
Thickness of bed	4		4	6½
Thickness of sample	3		3	3½

• Not included in sample.

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Section A (sample 75443) was cut off mining face in room 3 off main entry, 350 feet north of drift; section B (sample 75444) was cut 550 feet north of drift, off face in 5 room off the main entry (left side). The ultimate analysis of a composite sample, made by combining face samples 75443 and 75444, is given under laboratory No. 75445.

System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. All sizes were produced; coal was not screened or picked. At the time of sampling the daily output was 40 tons. At time of sampling the life of the mine was estimated at 20 years.

Toms Creek. Caney Mine

Analyses 32407 to 32409 (p. 29). Bituminous coal, Southwest Virginia fields, from Caney mine, a drift mine at Toms Creek on the Norfolk & Western Railway. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 6 feet to 7 feet 9 inches. Roof, shale; floor, shale. Cover at point of sampling, 500 feet. The bed was sampled at two points by Albert W. Giles, of the Virginia Geological Survey, July 18, 1919, as described below.

Sections of coal bed in Caney mine

Section	A		B	
Laboratory No	32407		32408	
Roof, shale.	*Ft.*	*in.*	*Ft.*	*in.*
Carbonaceous shale	*1	2		*1
Coal	2	2	2	
Sandstone		*1		*1½
Coal	1	9	1	5
Shale		*2		*½
Coal		2		2½
Shale		*2		*6
Coal		4		11
Shale				*6
Coal				*2
Floor, shale.				
Thickness of bed	6	0	7	9½
Thickness of sample	4	5	4	6½

*Excluded from sample.

Section A was measured 3 miles northeast of drift mouth, and section B 3¼ miles northeast of drift mouth.

At the time of sampling the daily capacity was 140 tons.

Toms Creek. Lee No. 6 Mine

Analyses 32410 to 32412 (p. 29). Bituminous coal, Southwest Virginia fields, from Lee No. 6 mine, Virginia Iron, Coal & Coke Co., a drift mine at Toms Creek on the Norfolk & Western Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness 7 feet 8½ inches to 7 feet 11 inches. Roof, shale; floor, shale. The bed was sampled at two points, having 50 to 500 feet of cover, by Albert W. Giles, of the Virginia Geological Survey, July 18, 1919, as described on page 60.

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Sections of coal bed in Lee No. 6 mine

Section	A	B
Laboratory No.	32410	32411
Roof, shale.	Ft. in.	Ft. in.
Carbonaceous shale	•1	
Coal	1 11	1 6
Shale		•½
Sandstone	•1½	
Coal	1 6	11
Sandstone		•1½
Carbonaceous shale	•10	
Coal	7	1 8
Shale	•½	•2
Coal	2 10	6
Shale		•½
Coal		1 3
Shale		•1
Coal		1 5
Floor, shale.		
Thickness of bed	7 11	7 8½
Thickness of sample	6 10	7 3

• Excluded from sample.

Section A was measured 50 to 60 feet from outcrop, 500 feet east of drift mouth and section B one-half mile northeast of drift mouth.

At the time of sampling the daily capacity of the mine was 200 tons.

Toms Creek. Sexton No. 2 Mine

Analyses 32413 (p. 29). Bituminous coal, Southwest Virginia fields, from Sexton No. 2 mine, a drift mine at Toms Creek on the Norfolk & Western Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 7 feet 4 inches. Roof, shale; floor, shale. Cover at point of sampling about 500 feet. The bed was sampled at one point, by Albert W. Giles, of the Virginia Geological Survey, July 19, 1919, as described below.

Sections of coal bed in Sexton No. 2 mine

Section	A
Laboratory No.	32413
Roof, shale.	Ft. in.
Coal	•6
Shale	•10
Coal	1 10
Sandstone	•1½
Coal	1 5
Shale	•½
Coal	4
Shale	•4
Coal	4
Shale	•1
Coal	11
Shale	•2
Coal	5
Floor, shale.	
Thickness of bed	7 4
Thickness of sample	5 3

• Excluded from sample.

This section was measured 2½ miles northeast of drift mouth.

At the time of sampling the daily capacity was 900 tons.

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Toms Creek. Thelma No. 1 Mine

Analyses 32404 to 32406 (p. 30). Bituminous coal, Southwest Virginia fields, from Thelma No. 1 mine, Virginia, Iron, Coal & Coke Co., a drift mine at Toms Creek, on the Norfolk & Western Railroad. Coal bed, Upper Banner; Pennsylvanian series, Norton formation; thickness, 7 feet 2 inches to 9 feet 6 inches. Roof, shale; floor, shale. Cover at point of sampling, 300 to 500 feet. The bed was measured at two points, by Albert W. Giles, of the Virginia Geological Survey, July 19, 1919, as described below.

Sections of coal bed in Thelma No. 1 mine

Section	A		B	
Laboratory No.	32404		32405	
	Ft.	*in.*	*Ft.*	*in.*
Roof, shale.				
Carbonaceous shale				*2
Coal	1	11		6
Carbonaceous shale				*7
Sandstone		*2		
Coal	1	4	2	2
Sandstone		*1		*1
Coal		8		1½
Sandstone				*1½
Coal				2
Sandstone				*1
Coal			1	2
Shale	*1	0	*1	1
Coal	2			4
Shale				*2
Coal			2	9
Floor, shale.				
Thickness of bed	7	2	9	6
Thickness of sample	5	11	7	2½

*Excluded from sample.

Section A was measured one-half mile southeast of drift mouth and section B 1 mile southeast of drift mouth.

At the time of sampling the daily capacity was 350 tons.

Virginia City. Virginia City No. 1 Mine

Analyses 32503 to 32507 (p. 30). Bituminous coal, Southwest Virginia fields, from Virginia City No. 1 mine, Virginia Iron, Coal & Coke Co., a drift mine, at Virginia City on the Norfolk & Western Railroad. Coal bed, Jawbone; Pennsylvanian series, Norton formation; thickness, 5 feet 4 inches to 6 feet 8 inches. Roof, "slate"; floor, clay. Cover at point of sampling, 500 feet. The bed was sampled at three points by C. K. Wentworth, of the United States Geological Survey, July 28, 1919, as described below.

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Sections of coal bed in Virginia City No. 1 mine

Section Laboratory No.	A 32503	B 32504	C 32505	D 32506
Roof, "slate":	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal		9	10	
Shale		¼		5
"Rash"	3 7			
Clay	•1 0			
Bone			¼	1
Coal	9	10	10	8
Coal and "rash"			•6	10
Bone		3	•9	
Coal		6	6	1 10
Coal (hard)		3 4	1 2	
Rash		•8	8	•1 6
Coal			1 2	1 4
Floor, clay:				
Thickness of bed	5 4	6 4¼	6 5¼	6 8
Thickness of sample	4 4	5 8¼	5 2¼	5 2

• Excluded from sample.

These samples were measured one-half mile north of opening. At the time of sampling the daily capacity was 400 tons.

Wise. Dean Bros. Mine.

Analysis 75746 (p. 30). Bituminous coal, Southwest Virginia fields, from Dean Bros. mine, a drift mine 2,225 feet above sea level, 2½ miles northwest of Wise, on the Interstate Railroad. Coal bed, Rocky Fork; Pennsylvanian series, Wise formation; thickness of bed, coal, and sample, 2 feet 2 inches; dip, horizontal. The bed was measured and sampled at one point by J. Brian Eby of the United States Geological Survey, August 20, 1920.

Sample 75746 was cut at face of main heading, 95 feet from drift mouth, due north.

System of mining, room and pillar. Coal was undercut by hand and shot down with black blasting powder. Coal was run of mine, all sizes being produced, and picked on car. At the time of sampling the daily output was 15 tons.

Wise. Gladeville No. 3 Mine

Analyses 75367 to 75370 (p. 30). Bituminous coal, Southwest Virginia fields, from No. 3 mine of Gladeville Coal Co., a drift mine 2,400 feet above sea level, one-half mile south of Wise, on the Norton & Norfolk Railroad. Coal bed, Norton; Pennsylvanian series, Norton formation; thickness, 3 feet 1¾ inches to 3 feet 5½ inches; dip, horizontal. The bed was measured and sampled at three points by J. Brian Eby for the United States Geological Survey, July 24, 1920, as described below.

Sections of coal bed in No. 3 mine, Gladeville Coal Co.

Section Laboratory No.	A 75367	B 75368	C 75369
	Ft. in.	Ft. in.	Ft. in.
Coal	3	3	3
Rash	½		
Bone and clay		•½	•½
Coal	1 5	1 7	1 7
Bone	½	¼	
Streaks of clay			½
Coal	1 1	10	1 1
Bone	1	½	½
Coal	6	4½	5
Thickness of bed	3 5	3 1¾	3 5½
Thickness of sample	3 5	3 1¼	3 5

• Not included in sample.

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Section A (sample 75367) was cut off chain pillar in 3 left entry, 700 feet from main line, 3,000 feet from drift; section B (sample 75368) was cut off face of heading of 4 right aircourse, off main line, 2,000 feet in; section C (sample 75369) was cut off south wall of breakthrough, 50 feet from head of 1 right off 20, 2,000 feet in. The ultimate analysis of a composite sample made by combining face samples 75367 to 75369 is given under laboratory No. 75370.

System of mining, room and pillar. Coal was undercut by machines and shot down with dynamite. Coal is run of mine, all sizes being produced. At the time of sampling the daily output was 200 tons. In 1920 the life of the mine was estimated at 10 years.

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ANALYSES OF DELIVERED COAL

By N. H. Snyder [10]

Coal analyses help to describe the character of coal as it lies in the ground or as it may be delivered to the user. There is a distinct difference between "mine samples" and "delivered samples." Analyses of mine samples of coal are plentiful, but available analyses of delivered coal are relatively few. Mine samples are collected according to a standard method.[11] The sampler cuts a channel 2 by 6 inches or 3 by 4 inches from roof to floor in the face of the bed, and excludes from the sample any partings more than three-eighths inch thick and any lenses or concretions of sulphur, or other impurities, more than 2 inches in maximum diameter and one-half inch thick.

Analyses of mine samples form a permanent or scientific record of the coal bed at the point sampled; they are important in determining the character of the coal in any given mine or district. When the samples are taken in a standardized manner, these analyses are valuable to the operator. When compared with analyses of delivered coal they show him whether or not his mine is being efficiently worked or whether the coal is being properly prepared—which involves the question whether he has suitable mechanical appliances for separating the impurities.

In the purchase of coal, mine samples may serve as a reliable guide to the experienced purchaser who has knowledge of the impurities in the bed, and the degree to which these are eliminated in mining and preparing the coal. To the average purchaser, however, unacquainted with these details, dependence on mine samples may be misleading. The quality of coal indicated by the face samples can rarely if ever be attained in the delivered coal. Certain impurities that are eliminated from the formally prepared mine sample may not be eliminated by the miner interested in getting out a large tonnage. Some of the roof and floor may also be included if these are soft or flaky. Some mine analyses, particularly those taken from geological reports, may be either from outcrop coal or small workings not beyond the influence of weathering. When coal prices are high and competition is lessened it is easy for the miner and the management to

[10] Engineer in charge of fuel inspection, Bureau of Mines.

[11] Holmes, J. A., The sampling of coal in the mine: Tech. Paper 1, Bureau of Mines, 1918, 17 pp.

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lower the standards of preparation of the coal, and a return to rigid standards is always difficult.

In sampling delivered coal the Bureau of Mines follows a definite procedure.[12] A sample of not less than 1,000 pounds is systematically collected by taking equal increments at regular intervals throughout the delivery, while coal is being loaded or unloaded, and by crushing and reducing this sample by successive stages to laboratory size.

In using analyses of samples of delivered coal it must be recognized that coal is not always of uniform size and that the impurities are not uniformly distributed throughout the mass. Hence there will be some variation in the results of sampling, and even though the same mass of coal is sampled a number of times, the analyses would not agree absolutely except by chance. It is only when a large number of analyses representing a considerable tonnage mined over a period of time are available that the average value and range of variation of a particular coal become known with certainty. With reasonable tolerances, however, for these variations, delivered coal can be sampled accurately enough for all practical purposes.

Delivered coal from any given mine may differ from day to day through variations in mining or preparing the coal; hence a record of analysis of delivered coal for any one time should not be considered as a permanent record, for the output may be greatly improved by new methods of mining and preparation; or, on the other hand, the output may deteriorate through carelessness in mining or preparation.

Table 3 gives the analyses of samples of Virginia coals collected by representatives of the various Government departments, under direction of the Bureau of Mines, from coal delivered to the Government under contract and of samples collected by representatives of the Bureau of Mines from coal deliveries to railroad cars at mine tipples. Samples were collected systematically throughout the entire delivery of coal. These records of delivered coal indicate more nearly what the consumer is likely to receive, but the amount of coal represented and the number of analyses made must be carefully considered

[12] Pope, G. S., Methods of sampling delivered coal and specifications for the purchase of coal for the Government: Bull. 116, Bureau of Mines, 1918, 64 pp. Pope, G. S., Directions for sampling coal for shipment or delivery: Tech. Paper 133, Bureau of Mines. 1917. 5 pp.

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TABLE 3.—*Analysis of*

Where mined			Size of coal	Approximate tons delivered
County and town	Mine	Bed		
1	2	3	4	5
DICKENSON COUNTY				
Splash Dam	Virginia	Splash Dam	Run of mine	13,866
Trammel	Banner No. 2	Upper Banner	Lump over 1¼-inch bar screen.	100
Do	do	do	Slack through 1¼-inch bar screen.	150
LEE COUNTY				
Crab Orchard	Morris prospect	Wilson	Run of mine	------
Crab Orchard (near)	Wilson Farm (big opening).	McConnell	do	------
Darby	Darby	Darby	Lump over 1½-inch bar screen.	------
Darbyville	do	No. 5 or Darby	Lump over 4-inch round screen.	100
Do	do	do	Egg over 1½-inch and through 4-inch round screen.	125
Do	do	do	Slack through 1½-inch round screen (washed).	100
St. Charles	Bondurant	do	Run of mine	100
Do	Dominion	do	Lump over 4-inch round screen.	100
Do	do	do	Run of mine through 4-inch round screen.	150
Do	Wilma No. 1	do	Lump over 1-inch bar screen.	50
MONTGOMERY COUNTY				
Blacksburg (near)	Poverty	Big Vein	Pea (semianthracite)	------
Do	do	do	Slack (anthracite)	10
Merrimac	Big Vein	do	Culm (semianthracite)	50
Do	Merrimac	do	So-called "sand coal"	50
RUSSELL COUNTY				
Dante	Nos. 2 and 5	Upper Banner	Run of mine	183
TAZEWELL COUNTY				
Pocahontas	Baby Pocahontas	Pocahontas No. 3	do	200
Do	Baby Pocahontas and West.	do	do	400
Do	Big Vein Nos. 1 and 2.	do	do	13,668
Do	do	do	do	17,407
Do	Big Vein No. 1	do	do	500
Do	Big Vein No. 2	do	do	450
Richlands (near)	Richlands	No. 4	do	------
WISE COUNTY				
Appalachia (near)	Inman		do	7,637
Glamorgan	Glamorgan	Edwards	do	11,076

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delivered coal

Proximate analysis					Calorific value, per pound						Number of analyses averaged	Place of delivery	Date of delivery
	Dry coal				As received		Dry coal		Moisture and ash free				
As received, moisture, per cent	Volatile matter, per cent	Fixed carbon, per cent	Ash, per cent	Sulphur, per cent	British thermal units	Calories	British thermal units	Calories	British thermal units	Calories			
6	7	8	9	10	11	12	13	14	15	16	17	18	19
2.2	31.5	60.4	8.1	0.9	13,840	7,689	14,150	7,861	15,400	8,556	54	U. S. Veterans' Hospital No. 60, Oteen, N. C.	1923–24.
1.3	31.9	61.7	6.4	.7	14,310	7,950	14,500	8,056	15,490	8,606	1	Tipple	Sept. 19, 1921.
1.2	31.4	58.3	10.3	.9	13,650	7,583	13,820	7,678	15,410	8,561	1	do	Do.
4.1	36.4	58.7	4.9	1.3	13,820	7,678	14,410	8,006	15,150	8,417	1	St. Louis testing plant	1905.
3.4	36.4	57.8	5.8	1.0	13,920	7,733	14,410	8,006	15,300	8,500	1	do	1905.
4.4	38.6	56.9	4.5	.8	13,930	7,739	14,570	8,094	15,260	8,478	1	do	1905.
2.4	37.2	59.6	3.2	.5	14,200	7,889	14,550	8,083	15,030	8,350	1	Tipple	Sept. 14, 1921.
2.8	37.7	56.3	6.0	.5	13,680	7,600	14,070	7,817	14,970	8,317	1	do	Sept. 15, 1921.
3.7	36.6	59.9	3.5	.5	13,560	7,533	14,380	7,989	14,900	8,278	1	do	Do.
3.3	36.3	56.7	7.0	.6	13,340	7,411	13,800	7,667	14,840	8,244	1	do	Sept. 12, 1921.
2.7	37.8	59.6	2.6	.5	14,190	7,883	14,580	8,100	14,970	8,317	1	do	Sept. 9, 1921.
3.4	35.4	56.4	8.2	.5	13,180	7,322	13,640	7,578	14,860	8,256	1	do	Do.
1.3	39.8	57.0	3.2	.5	14,210	7,894	14,400	8,000	14,880	8,267	1	do	Sept. 13, 1921.
4.8	10.6	70.5	18.9	.7	11,960	6,644	12,560	6,978	15,490	8,606	1	St. Louis testing plant	1906.
7.5	11.1	71.3	17.6	.7	11,900	6,611	12,860	7,144	15,610	8,672	1	do	1906.
2.1	6.7	59.5	33.8	.5	9,680	5,378	9,890	5,494	14,940	8,300	1	U. S. fuel-testing plant, Norfolk, Va.	1907.
2.2	10.2	83.4	6.4	.5	14,270	7,928	14,590	8,106	15,590	8,661	1	Railroad car at mine	May 13, 1918.
2.7	35.5	57.4	7.1	.7	14,070	7,817	14,460	8,033	15,570	8,650	4	Panama R. R. Co., Lamberts Point, Va.	Aug., 1910.
1.6	17.5	76.5	6.0	.8	14,680	8,156	14,920	8,289	15,870	8,817	1	U. S. fuel-testing plant, Norfolk, Va.	1907.
2.8	20.1	73.8	6.1	.5	14,490	8,050	14,910	8,283	15,880	8,822	1	Lamberts Point, Va	Feb. 20 to Mar. 5, 1918.
3.0	20.9	73.7	5.4	.7	14,480	8,044	14,930	8,294	15,780	8,767	160	Navy yard, Norfolk, Va.	1909–10.
3.1	20.1	74.9	5.0	.7	14,550	8,083	15,020	8,344	15,810	8,783	215	Navy yards, Norfolk, Va., and Charleston, S. C.	1910–11.
2.8	20.4	73.2	6.4	.6	14,210	7,894	14,620	8,122	15,620	8,678	1	Lamberts Point, Va	Dec. 1, 1917, to June 17, 1918.
4.5	21.7	71.9	6.4	.6	14,030	7,794	14,690	8,161	15,690	8,717	1	do	Apr. 10 to June 6, 1918.
5.6	24.4	65.2	10.4	1.3	13,260	7,367	14,050	7,806	15,680	8,711	1	St. Louis testing plant	1906.
1.8	35.4	59.4	5.2	.7	14,230	7,906	14,490	8,050	15,280	8,489	91	U. S. Engineers, Savannah, Ga.	1915–16.
2.0	33.2	58.3	8.5	1.3	13,740	7,633	14,020	7,789	15,320	8,511	24	Fort Bragg, N. C., and Fort Moultrie, S. C.	1923–24.

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TABLE 3.—*Analysis of*

Where mined			Size of coal	Approximate tons delivered
County and town	Mine	Bed		
1	2	3	4	5
Pardee	Pardee	Pardee	Lump over 4-inch round screen.	379
Stonega	Stonega	Kelly-Imboden	Run of mine	4,757
Toms Creek	Coburn	Upper Banner	Lump over 3½-inch bar screen.	
DICKENSON, RUSSELL, AND WISE COUNTIES				
Dante (near)	Clinchfield mines	Upper and Lower Banner.	do	1,289
Do	do	do	do	1,497
Do	do	do	do	1,220
Do	do	do	do	5,994
Do	do	do	do	24,067
Do	do	do	do	13,649
Do	do	do	do	11,243
Do	do	do	do	425
Do	do	do	Stoker	3,418
Do	do	do	Sized steam	6,239

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delivered coal

Proximate analysis					Calorific value, per pound						Number of analyses averaged	Place of delivery	Date of delivery
	Dry coal				As received		Dry coal		Moisture and ash free				
As received, moisture, per cent	Volatile matter, per cent	Fixed carbon, per cent	Ash, per cent	Sulphur, per cent	British thermal units	Calories	British thermal units	Calories	British thermal units	Calories			
6	7	8	9	10	11	12	13	14	15	16	17	18	19
2.0	36.7	55.9	7.4	1.1	13,730	7,628	14,010	7,782	15,130	8,406	2	Cherokee Indian School, N. C.	1923–24.
2.0	33.4	56.8	9.8	.8	13,380	7,433	13,650	7,583	15,130	8,406	6	Marine Barracks, Port Royal, S. C.	1916–17.
3.1	32.7	62.7	4.6	.7	14,470	8,039	14,930	8,294	15,650	8,694	1	St. Louis testing plant.	1905.
1.8	34.2	58.2	7.6	.6	13,990	7,772	14,250	7,917	15,420	8,567	23	Mountain Branch, National Home for Disabled and Volunteer Soldiers, Tennessee.	1910–11.
2.0	34.5	55.7	9.8	.7	13,580	7,544	13,860	7,700	15,370	8,539	29	....do....	1911–12.
2.2	36.9	54.4	8.7	.7	13,700	7,611	14,010	7,783	15,350	8,528	14	U. S Engineers, Charleston, S. C.	1912–13.
2.2	35.9	55.4	8.7	.6	13,710	7,617	14,020	7,789	15,360	8,533	36	National Home for Disabled and Volunteer Soldiers, Tennessee, and U. S. Engineers, Georgetown, S. C.	1913–14.
2.1	35.6	56.2	8.2	.6	13,820	7,678	14,120	7,844	15,380	8,544	70	Q. M. vessels, Galveston, Tex.; National Home for Disabled and Volunteer Soldiers, Tennessee; and 6th lighthouse district, Charleston, S. C.	1914–15.
1.6	34.8	56.8	8.4	.6	13,890	7,717	14,120	7,844	15,410	8,561	51	Navy yard, and sixth lighthouse district, Charleston, S. C.; National Home for Disabled and Volunteer Soldiers, Tennessee; and U.S. Engineers, Georgetown, S. C.	1915–16.
1.7	35.0	56.4	8.6	.7	13,820	7,678	14,060	7,811	15,380	8,544	14	Sixth lighthouse district, Charleston, S. C.; National Home for Disabled and Volunteer Soldiers, Tennessee.	1916–17.
2.5	31.1	61.5	7.4	.8	13,920	7,733	14,280	7,933	15,420	8,567	4	Sixth lighthouse district, Charleston, S. C.	1921–22.
1.6	36.3	54.9	8.8	.6	13,820	7,678	14,040	7,800	15,390	8,550	32	National Home for Disabled and Volunteer Soldiers, Tennessee.	1912–13.
2.4	36.2	52.1	11.7	.6	13,160	7,311	13,480	7,489	15,270	8,483	32	U. S. Engineers, Charleston, S. C	1913–14.

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